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Angola, Water and Sanitation

Angola: A New Outlook on Water and Sanitation Education

In 1975, The Republic of Angola was established as a country in southwestern Africa. After gaining its independence, the country entered a civil war that lasted almost three decades, ending in 2002. As a large country, Angola has a wide variety of landscapes, including the semi-desert Atlantic area bordering its neighboring country Namibia's "Skeleton Coast." The interior is sparsely populated rainforest with densely settled towns and cities on the northern coast and north-central river valleys. Located along the Atlantic coast on the northwest side of Angola is the capital city Luanda, named the world's most expensive city multiple times because of the civil war which left the country vulnerable. Rebuilding from the war since 2002, Luanda is still recovering today. Angola is the seventh largest country in Africa with a population of 28.81 million people and a land area of 481,354 sq. miles (smaller than the size of Alaska, but larger than Texas in the United States). The population is 61.5% urban while 38.5% is rural. The most predominantly spoken language is Portuguese along with other mother-tongue languages. Angola has a semi-presidential republic government ruled by President Jose Eduardo and Prime Minister Fernando de Piedade Dias Dos Santos ("Angola").

Angola lies in a sub-tropical zone and yet its climate is relatively cool considering the country's close proximity to the equator. The coastline is tempered by the cool Benguela Current, resulting in a climate similar to coastal Peru. It is semiarid in the South along the coast to Luanda. Temperatures in the capital city average 25 degrees Celsius in January and 21 degrees Celsius in their winter month of July. Summers are very hot and dry, while winters are mild. With less rain along the coast, Luanda annually has an average rainfall of 300 mm. Like the rest of tropical Africa, Angola experiences distinct, alternating rainy and dry seasons. The short rainy season, lasting from February to April, provides most of the country's rainfall. Northern Angola has a cool, dry season also. The climate is greatly influenced by the prevailing winds, which are west, southwest and south southwest. Two of the seasons are distinguished – the cool season, from June to September; and the long rainy season, from October to May. Most of the heaviest rainfall occurs in April and is accompanied by violent storms. However the large city of Cabinda enjoys rain throughout much of the year ("Angola").

The coast is for the most part flat, with occasional low cliffs and bluffs of red sandstone. Angola also has mountainous terrain further inland, but there are also portions of the northern coastal plain which are covered by thick brush and is mostly uninhabited. Where shallower bays are numerous it is hard for large ships to unload close to shore, but there is one deep inlet of the sea – [Great Fish Bay](#). Farther north are [Port Alexander, Little Fish Bay and Lobito Bay](#), while shallower bays are numerous. Lobito Bay has water sufficient ports to allow large ships to unload close inshore ("1911 Encyclopædia Britannica/Angola").

Angola currently imports more than half of its food, research shows the figure as high as 90%. Angola is currently the United States' fifth largest market for poultry products in the world, and the third largest market in Africa for all other agricultural exports. Cotton, sisal, and corn are important cash crops, while cassava (manioc), millet, sorghum, and rice are grown as subsistence crops. Livestock such as goats, pigs, and chickens are also kept for subsistence farming. Only 3% of the land is currently cultivated with less than 1% irrigated of its 58 million hectares of agricultural land available. Angola has 97% of non-cultivated land available for use. An estimated 90% of the farms in Angola are small to medium in size and are used mainly in communal ways for subsistence farming ("Angola").

At the beginning of the 21st century Angola was a country ravaged by war and related effects of landmines and malnutrition made it dependent on the international community for the basics of survival. Over half of the population is still unemployed and seventy percent of the population lives below the poverty line. Hunger is a threat in many areas. Settlements called musseques house the urban poor in Luanda and other large towns. Rural villages tend to be small in size. Housing is generally kept clean and is often constructed of adobe or brick and roofed with sheet metal. More traditional construction techniques are still known to some, but for the most part, fewer homes are made with wattle and daub walls and thatched roofs. There is virtually no electricity in smaller rural villages, and most towns only have it intermittently. Running water is also intermittent or unavailable in many areas (“Angola”).

Coastal people include a large variety of seafood in their diet. Prawns and white fish such as tilapia are used in many recipes. As much of sub-Saharan Africa, palm oil is also an indispensable part of many Angolan dishes. While herders in the southwest rely mostly on dairy products and meat, farmers eat maize, sorghum, cassava and other agricultural crops. Especially in urban areas, but also in the drier rural areas, gathering water and firewood is often very time-consuming (“Angola Countries and Their Cultures”).

Angola is a potentially rich country. Petroleum in the Cabinda enclave; diamonds in Luanda; and iron, phosphates, copper, gold, bauxite, and uranium in the other provinces are some of the natural resources. In comparison with other sub-Saharan countries, Angola is industrialized to a considerable degree and has a relatively high income per capita (“Angola Countries and Their Cultures”). The major problem is most of these resources are used to finance the military as Angola has a war economy. These resources could finance water and sanitation education solutions along with the military if implemented correctly.

The lack of reliable data about a typical Angolan family provided no information on how large a typical family is. However data did show many families are broken from the civil war including missing fathers and young boys. These families struggle with the lack of a father figure and a smaller income that can't provide basic necessities. Where adults can't farm or find work and are suffering from diseases, children often become the main income-earners. Children then have more responsibility at a young age with a number of household chores such as fetching water, looking after siblings, taking animals to graze, gathering firewood, or helping to raise crops in family fields. Some steal goods or beg on the streets, while others find items to sell from dumps or work in other people's fields (“Angola”).

“After the end of the civil war, the challenge of rebuilding the healthcare infrastructure and attracting health care workers began. Medicines and other medical supplies remain in very short supply. Malaria, diarrheal diseases, and severe malnutrition- sometimes bordering on starvation- are rife, and cholera epidemics, owing to unsanitary conditions, frequently occur.” The many years of warfare that kept the Angolan population mostly isolated has made the rate of HIV/AIDS much lower than other African countries (“Angola”).

Conditions in schools declined dramatically because of the war, with an acute shortage of teachers and even the most basic teaching materials. Most facilities in the universities were closed for long periods of time because of alleged political agitation. Angola's government provides free education, which is compulsory for eight years. Primary education begins at the age of seven and continues for four years. Secondary education is comprised of two cycles; one beginning at age eleven lasting four years then followed by a three-year cycle. Higher education in Angola is provided by institutions such as the Catholic University of Angola and Jean Piaget University of Angola (“Angola”).

A major factor affecting Angola since the civil war is water and sanitation. Knowledge of keeping fecal matter away from water sources and how to kill bacteria would be just the beginning. Water and sanitation has a major impact on food security. Water is used in many ways to cook and the only way that

the water is one hundred percent bacteria free is boiling the water before use. Not all water is boiled before use to cook which indicates that the water used in main dishes is still contaminated. “Providing sustainable access to improved drinking water sources is one of the most important things we can do to reduce disease.” said Dr. Margaret Chan (“Millennium Development Goal Drinking Water Target Met”).

Angola has Millennium Development Goals (MDGs) to eliminate contaminated water use. As to whether or not Angola is on-track to meet water and sanitation MDG targets, the lack of reliable data on access to water filters and the limited availability of results from ongoing investment programs make it difficult to estimate both sector needs and progress for water and sanitation. The scale and scope of recent investments is nonetheless impressive, and if efficiently and effectively utilized is likely to result in meeting the Millennium Development Goal target for fresh water supply, though the progress in rural areas is less certain than in urban. The same applies to sanitation, with likely success in urban areas, but progress lagging and limited investments on the horizon for rural sanitation. Reaching the targets would be a remarkable achievement considering the fact that Angola’s decades-long conflict ended only recently in 2002. (“Water Supply and Sanitation in Angola.”)

UNICEF works in 190 countries and territories to help children survive and thrive, from early childhood through adolescence. The world’s largest provider of vaccines for developing countries, UNICEF supports child health and nutrition, good water and sanitation, quality basic education for all boys and girls, and the protection of children from violence, exploitation, and AIDS. UNICEF is funded entirely by the voluntary contributions of individuals, businesses, foundations and governments. (“Safe Water Saves Lives in Angola”).

In Angola rivers are plentiful, but no longer fit for drinking. Before a UNICEF-supported programme known as ‘Agua Para Todos,’ (‘Water for All’) arrived to set up a water treatment plant, many people in the Kamikoto area died from drinking dirty water – especially children. Water is filtered by the plant and chlorine is added with just the right amount to disinfect. With clean water the village can now build a secondary school for older students who currently have to travel an hour to a school. Today the water treatment plant serves 2,500 people daily. The plant was installed by UNICEF and is owned by a local resident who has a maintenance man who maintains any problems that may occur through the day. He receives only \$64 a month that income pays for his children’s clothes and schooling. (“Safe Water Saves Lives in Angola”).

A logical and cost efficient solution to water and sanitation issues in Angola is the Drinkable Book. This technology uses a paper coated in silver nanoparticles which kills 99% of bacteria which is equivalent to filtered U.S. tap water. Distributed by WATERisLIFE.com with the help of donations from organizations such as the United Nations, the World Food Programme, and the World Food Bank. The drinkable book is the first ever manual and water filter that provides safe water, sanitation, and hygiene all in one. Each filter has educational reminders to keep things clean and how to manage basic hygiene daily. The WATERisLIFE organization is in the process of producing the book in different languages with varying teaching methods to enhance the educational aspect. Each book can provide a user with clean water for up to four years. WATERisLIFE has introduced a campaign to move into full production of The Drinkable Book. With help from other world organizations, we can implement the books as a part of our WASH approach, as well as make the books available for global partner distribution. The Drinkable book costs only mere pennies to produce: an estimated 10 cents per page (“Clean Water”). The Drinkable Book has 20 pages and each page filters water for 30 days. This is a total cost of \$2.00 for an individual to have fresh water for four years.

Another slightly less cost efficient solution to Angolan water and sanitation issues is the CleanSip straw also distributed by WATERisLIFE. How the CleanSip filters water is inside the WATERisLIFE straw are membranes, iodized crystals, and active carbon, which removes the iodine taste and medium size bacteria.

The technology protects against waterborne bacteria and viruses like typhoid, cholera, E. coli, dysentery and diarrhea. The smaller filters use new groundbreaking technology to cover a broader range of contaminants. Additionally, these filters deal with heavy metals such as lead, mercury, and aluminum, arsenic, fluoride, chlorine, cadmium, giardia, E Coli, algae, hydrogen sulfide, cholera, and typhoid. Each WATERisLIFE straw filter will provide hundreds of liters of clean water (typical use is 2-3 liters of water per day per person). Once it is no longer effective, the straw will stop being able to draw water. Just \$10 puts a filter into the hands of a person who desperately needs it (“Clean Water”).

Poor water and sanitation is related directly with diseases such as: Diarrhea, Cholera, Malaria, Arsenicosis, and Typhoid. These diseases and many others are water borne which means the water Angolans are drinking daily is infested with pathogenic bacteria from various diseases. Each one of these diseases has severe effects on the body. Families are suffering from dehydration, weakened immune systems, malnutrition, skin keratosis, headaches, nausea, and loss of appetite. More importantly the most fatal result is death from water borne diseases which can be prevented. The simple act of washing hands with soap and water can cut diarrheal disease by one-third. Providing adequate sanitation facilities is the key to preventing waterborne diseases. Eliminating standing water close to residential communities and in homes is important to prevent high mosquito populations carrying diseases. (“Water, Sanitation and Hygiene.”)

The importance of water and sanitation education will save lives in the future with the help of cost efficient solutions such as the Drinkable book and CleanSip straw. Issues need to be addressed to ensure finance is effectively turned into accelerated coverage in water supply and sanitation. The downside to potential solutions is nothing is 100% free. Every possible solution has to come from some sort of fund or donation. However the less costly the solution, the easier it is to implement and continue in the future. We can look to organizations such as UNICEF and other organizations for helping with funding. One organization making impactful progress is the WATERisLIFE organization. This organization is working around the world to end the world water crisis. Fourteen different countries are becoming more successful every day with the help of water and sanitation education from WATERisLIFE.

Each of these solutions could be funded without the help of government, but rather small communities of concerned students from around the world coming together that could potentially set up exciting fundraisers for many age groups to participate in with intentions of donating the profits towards drinkable books. Such fundraisers include volleyball tournaments including other sports, five kilometer run/walks, and relay races. Although the Angolan government should step up and pay for some of this, but the government is too focused on the military. Relying on the government isn't helping now, however actions from small communities can make a big impact. USAID also can help with this, their mission is to develop systems for community water management. “USAID provides access to adequate quantities of potable water and improved sanitation services at an acceptable cost and on sustainable basis and contributes to the reduction of waterborne diseases in the provinces of Luanda, Benguela, Bengo and Uige.” (“WATER AND SANITATION | Angola.”)

Success stories about these two technologies include the CleanSip straw used in Flint, Michigan. With the help of fundraising at Michigan State University through a series of volleyball tournaments and products from the WATERisLIFE organization. Michigan State University raised more than ten thousand dollars for the city of Flint, Michigan to provide CleanSip straws for those in need. This donation provided twelve hundred straws to children and their families to filter the lead from their drinking water during the water crisis. The success of this product, used in the United States, is a perfect reason why this would be successful in other parts of the world, specifically, Angola. Another success story is from Thailand where WATERisLIFE used virtual reality to show children the monsters that live in the polluted river water they drink when they don't have rainwater readily available for drinking. Children from villages near the polluted river played a game designed to look like their local river. The object of the game was to defeat

the monsters that are bacteria in the river. After defeating the monsters on the game they were given their own weapons to defeat their monsters. The weapon was their CleanSip straw.

In conclusion water and sanitation has a major impact on food security. Water is the most valuable resource to the human body and in most places often seems limitless. Humans eat, drink, cook, and bath with water and the only way that the water is one hundred percent bacteria free in rural areas in Angola is boiling the water before use. Contaminated water is the leading source to waterborne diseases. Many of these waterborne diseases cause severe illness and deaths each year. Providing sustainable access to improved fresh drinking water sources is the most important thing we can do to reduce waterborne diseases. Eliminating contaminated water ensures a healthy lifestyle for the people of Angola. Cooking in fresh water will also have a major effect on food insecurity. Solutions that eliminate waterborne diseases include the Drinkable Book and the CleanSip straw. If we can solve this problem, Angolans will continue to recover from a turbulent past and build a more sustainable future with fresh, clean water.

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