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India: Water Sanitation

India is a diverse country of mega cities and a vast agricultural economy. The overwhelming majority of the population suffers from a lack of a clean, pure water supply. With an average Indian family consisting of approximately five people, the lower classes of the caste system are those who suffer the most from the lack of a consistent source of hydration, as they are unable to spend their income on water that is so highly priced due to cleaning and sanitation costs. A clean supply is fundamental to good health. Over 70% of the average income in India is spent on health care (“Highlighted Articles”). It is a proven fact that this high cost of healthcare is due to the poor water sanitation. Without potable water, disease and dehydration is the norm. This issue can be traced back to a lack of education concerning water sanitation, and citizens constantly being in contact with the contaminated liquid. To promote the availability of this fundamental human need, easy and sustainable methods to capture and purify water supplies is critical. As the world population grows and fresh water becomes a more valuable resource, India will not be able to rely on outside assistance from surrounding countries for help. Assistance is something that is only temporary. A reliable source of potable water is not only a health issue, but also vital to the economic growth potential of India. Once the Indian residents have stabilized the health issues associated with contaminated water, a greater portion of their income can be spent locally, while growing businesses and developing agricultural efficiency. It is my premise that if the poorest Indian residents can be given access to the materials and knowledge to access and protect potable water, then in turn, the economy of India will see the beginning of a solid foundation upon which it can prosper.

The typical Indian Family consists of a mother, father, and 2-3 children. In India the first male child traditionally follows in his father’s footsteps taking over the family trade, predominantly out of responsibility for taking care of his parents. The lower classes do not have as many opportunities to explore much further than where they live. This limits their choices to go out and make a living for themselves, whereas instead they focus on providing whatever type of food the family can afford. While this can prove to be a difficult task, one can apply for a government aid or work with other groups of family to put food on the table. The dietary customs in India include several small meals that begin at dawn, starting with a prayer and small snack. Breakfast consists of a fried potato pastry (aloo paratha) and is followed by another snack of spicy vegetables, rice and bread. A late dinner is consumed with the leftovers from lunch, along with milk tea with cardamom before bed. Indian food is well known for incorporating spices into the recipes, serving as both a preservative and a flavor. With over 72% of the water supply being contaminated, spice also can destroy potential pathogens that would otherwise cause gastrointestinal issues. Another issue affecting food choice is religion. Religion is a very big influence on what can and cannot be consumed. With 81% of the population being Hindus, and 13% being Muslim, pork and beef are almost never consumed (“Agriculture in India”). Due to this, most of the population relies heavily on grains, vegetables, and fish as a source of protein. This can be a very nutritional diet plan if prepared properly.

Most of the population of India is located in the urban areas. Depending on the city and area of the city this could be shiny new buildings or scraps pieced together in roughly crafted shacks. The countryside is quite different. The average farmer in an area of hardship raises his crops on ¼ of an acre of land using his or her hands for the main tools (“Typical Diet in India”). Typically, there are more female than male farmers. The reasoning behind this is that the men are out either helping to market the farm products, or working a different job to provide for their family. India has a very high rate of engineers per capita. Unfortunately, many of the men and women who are educated are unable to find a job at their

level of expertise, which creates a problem for the economy. Two of the fastest growing industries currently is aquaculture and poultry production. Aquaculture is in large demand as 94% of the population does not consume beef or pork, and the country is located in close proximity to water ("Agriculture in India"). Wheat and rice are the leading crops produced with the current climate. Other crops include: sugarcane, pulses, oilseeds and potatoes; along with non-food items just as jute, cotton, coffee, rubber and tea. Each and every item India produces is used to benefit their country and add to their economy.

The agricultural practices have become much more modern in the past few decades. They have improved the quality of life by using advanced technology in fertilizers, tractors, and new ways to help farming. The crops are grown on a seasonal basis and exported to various countries. The monsoons in India lead to extreme weather climates ranging from drought to flooding. During times of drought, the farmers must use the scarce amount of water available to water their crops. The only water they can get is contaminated from a wide variety of sources such as sewers, manufacturing facilities, and urban runoff. With this, these factors are contaminating the food supply before it has even been harvested and sent off to production plants. Many issues arise with this situation that need to be solved.

One possible solution for improving agricultural yields is to capture and store rainwater. This simple activity is not being done enough in areas that could benefit immensely from it. Once the rainwater is stored, it is fairly pure. It also can be rationed off depending on how much rain was received, allowing people to get the most of every last drop. Also, if using a different source of water than that which has been soiled, this allows the water from the rivers to slowly recover from harmful bacteria. Earth has naturally recurring cycles designed to restore nature over extended periods of time.

Efforts to increase literacy in India are working. In 2011 the Indian literacy rate was 74%, which increased 9% from the 2001 literacy rate of 65% ("Indian States Ranking by Literacy Rate"). Researchers believe women becoming more influential in society has contributed to this increase. While Indian women do not have the same rights as men, there has been a substantial growth in what they can do. Today, the average Indian woman is allowed the opportunity to take a job outside the home, the ability to further or start their education, and a fair chance at available job opportunities. With this increase of educated women, India's economy has become ranked fourth worldwide.

The benefit to this stronger economy is now India's government can afford to spend money on the people that need more help. They also can spend money on projects to improve the quality of life. In 2009 India decided to purify the holy waters of the Ganges River. This \$2 billion multi-year project included removing billions of liters of contaminants. Treatment plants in northern Indian cities such as Kanpur, Lucknow, and Allahabad which are all located on the Ganges River, currently have the capacity to clean 220 million gallons of the 660 million gallons of sewage released by those cities into the river each day.

The city of Delhi alone has 30 sewage treatment plants, yet sewer pipes currently reach only half the city's inhabitants with the remaining 50% of the city's raw sewage flowing directly into the Ganges River. Unpaid electricity bills mean many treatment plants sit idle, while the sewage content of the rivers is concentrated because fresh water further upstream is diverted into the cities for drinking. People still defecate in the river. The plumbing is not utilized by those who have access to it, because there is a lack of maintenance and a low supply of water. According to experts, the best way to solve any issue with water is to let freshwater flow into the area to dilute the bad toxins and waste. This directly applies to sewage treatment plants. Allowing the non-purified fresh water to naturally dilute the highly concentrated contaminated water, would be an improvement on water management in the country.

In urban areas, poverty is more prominent from a visual standpoint, meaning it is more apparent to those passing by looking at the rows of poorly constructed shacks and malnourished faces than when in the country. The scarce amounts of people living in the outskirts of towns hide their lack of money only

slightly better than those in urban areas. They usually live in shacks that are a reflection of how much profit they make yearly. While both of these situations relate directly to the poorer classes, there is a direct correlation to how both areas spend their money on food and health care. While this is true in most areas of the world, India's proportions make them different. 70% is spent on health care; approximately 25% is spent on food, leaving almost no extra room for other items in their budget ("Indian States Ranking by Household Size"). Most of that 70% is still not getting the adequate amount of coverage needed. The best overall healthcare is delivered through a private sector, due to 90% of the doctors working privately. While those who can afford the doctors have easy access to health care, nearly 600 million people who live in rural and poor urban areas cannot afford the quality health care beyond their reach. ("Indian States Ranking by Household Size"). This is harmful due to the fact that they cannot afford a sanitation system that manages human fecal waste, and it is not available to large portions of the country. With no means to relieve themselves they are forced to defecate in the rivers and waterways making their issues even bigger. They also are required to drink, cook with, and bathe in those very same waters. The solution, it seems, is to introduce a water purifier, or teach the native people how to add preservatives to the water to make it clean.

To improve upon the situation of potable water scarcity for the typical rural family and farm needs, I would like to promote the idea of leveraging the structure and momentum of existing clean water projects around the world with adaptations specific to the climate and needs of India.

The first component would be to spread the use of cisterns to capture clean rain-water. I recommend a grant program co-sponsored by the Indian government and a private sector foundation. For India, I would name this grant program, "Cisterns for Citizens". The program would fund the materials for the average rural family, to build a cistern and leverage the free water supplied during the monsoon season, captured as runoff from the steel corrugated roof of a typical house unit. In order to receive the kit materials and assembly tools for the cistern, the family would be required to attend an educational seminar on the impacts of using potable water with food to prevent disease. This same seminar would teach proper assembly of the cistern and the assembly tools would be of the nature that they would be highly useful for a typical manually cultivated farm.

The Indian government is a democracy. The ordinary citizens can organize to show they support clean water initiatives regardless of their income. They can also be part of the solution by becoming a trainer of clean water techniques to promote the message. Thus, the public could address their own needs and address the contaminated water challenges from happening to the future generations of their country. This is an excellent option and provides many benefits decades from now. The main issue with it though, is the expense of the education and communicating it to an enormous population.

To start the funding of this project, A current initiative for Africa could be expanded for the benefit of rural India. This existing fundraising initiative is The Water Project (thewaterproject.org). This is a non-profit organization currently attempting to help water sanitation in African countries. Their approach is to fundraise using donations and "The Water Challenge" to build wells and educate the people on what is and is not correct procedure for water consumption and sanitation. The Water Challenge is a two-week program consisting of a group of highly motivated people who want to make a difference ("Give Water. See Your Impact"). For 14 days the group drinks only tap water from a sink or drinking fountain. They are not allowed to spend money on bottled water, milk, energy drinks, etc. All the money they would have spent on the purchased beverages is put into a cup and donated back to the foundation where they then can see exactly how they made a difference. The Water Challenge is just one of many ways The Water Project raises funds. This is something that could be done in many different countries that have a lack of clean water resources, one of those being India. I would like to expand The Water Project into India so more people can benefit from initiatives that already exist, and are already making a difference in others' lives. To increase awareness, an individual could create a presentation on Ted.com, an Internet

based lecture series that talks about The Water Project, and the benefits it possesses. Other options include: publishing an article in a major magazine, having talk shows discuss it, and by writing letters to your local newspaper. All of these are very plausible and absolutely can be accomplished.

In conclusion, all people in India can have an impact on how the country will fix this issue. The National Government can provide funding for the project; their incentive behind this is because the less money people spend on health care and other objects that they need, but are highly overpriced, the more money they can spend on local businesses—greatly improving the economy and boosting them up as a powerful nation. Both the government and non-profit organizations can sponsor the “Cisterns for Citizens” project and make the seminars possible by having people volunteer to teach the classes or donate supplies. Barriers that could make government involvement difficult include: funding, acquiring supplies, and initiating the project. These can be solved by starting “Cisterns for Citizens” on a small scale to allowing funding to be spread out over a period of time, using recycled cisterns that are donated by organizations and private donations.

Communities play a huge role because they will be the people actually promoting the project. Each community holds a seminar that includes education and “Cisterns for Citizens” packets for construction. Rural families are key players in this program as they are the people who are attending the seminars and building the cisterns.

India is making great progress as a country, but they have many issues that still need to be sorted out. With the help of organizations and dedication from the people, along with the government, this can and will be accomplished. India has highly intelligent citizens and could have the potential to become very powerful, once the large majority of the people are in good health and have decent living conditions. We need to educate everyone on sanitation, and set up areas to catch rainfall, as well as dig public wells for the population. Newly graduated engineers would be wonderful in a field working on improving the health and safety of their country. Once India decides that water sanitation is the key to maintaining their culture and economy, then we will see drastic changes in the quality of life. Water sanitation will have a huge effect on the future. With the ever-increasing population, climate change, and energy demands, water will become even more scarce. This potentially could wipe out entire countries that do not have a solid plan for standards of water safety. This is why I believe educating the general public on what they can do to help themselves is so crucial. If we start now, we will be not only promoting, but also saving the future.

Works Cited

"Agriculture in India." *Wikipedia*. Wikimedia Foundation, 31 Mar. 2013. Web. 31 Mar. 2013.

"Give Water. See Your Impact." *The Water Project*. N.p., n.d. Web. 31 Mar. 2013.

"Highlighted Articles." *Highlighted Articles*. N.p., n.d. Web. 31 Mar. 2013.

"Indian States Ranking by Household Size." *Wikipedia*. Wikimedia Foundation, 17 Mar. 2013. Web. 31 Mar. 2013.

"Indian States Ranking by Literacy Rate." *Wikipedia*. Wikimedia Foundation, 17 Mar. 2013. Web. 31 Mar. 2013.

"Nelson, Dean." *India Plans £2bn Clean-up of the Ganges*. N.p., 6 Oct. 2009. Web. 31 Mar. 2013.

"Shocked Investor." : *2010 Percentage of Income Spent on Food, Per Country*. N.p., n.d. Web. 01 Apr. 2013.

"Typical Diet in India." *LIVESTRONG.COM*. N.p., n.d. Web. 31 Mar. 2013.