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India, Water and Sanitation

India: A Cleaner Approach to Water

I chose India as a country because it held interest to me. This country's population is about 1,380 billion people and of this population 27.82 % are urban and 72.18% are rural. They have a parliamentary form of government. It was adopted in 1950; "lays down the framework for fundamental political principles, establishes structure, and sets out fundamental rights." India is led by a chief of state and prime minister. (Michigan State University, 2021) When looking at the land of India about 61 million acres are cultivated. They export tea, sugarcane and cotton. India's average farm size is 2.66 acres which is about 2 football fields. An aerial view of India points out that their geography is mountains, desert, plains and hills. Their climate ranges from tropical rain to a dry climate.

A typical family is about five people and they live in low-rise apartments commonly eating rice, wheat, dried beans, and peas. They commonly obtain their food from 13.22% online, 40.77% corner shops, and 46.01% supermarkets. According to career trends the most popular jobs in India are in retail, real estate, agriculture and organic farming.

According to worldpopulation.com the average wage in terms of United States dollars is two thousand one hundred and thirty dollars per year. Less than half of all children between the ages of 6-14 are able to attend school (Smile Foundation, 2020). In India they have the "right to health" for all, but India's health care has been extremely unfunded according to commonwealthfund.org. Sadly, less than 50% of all of the drinking water is safe to drink. Contributing to the challenges within the country, I found that a total of 240 million people living in India do not have access to electricity. In addition, 69.3% of rural households are without toilets. Interestingly, there are 30 vehicles for every 1000 people in India. What would be the cause behind this gap? One main barrier is the combination related to lack of transportation for people and the low wages combined with large families. This same barrier of low wages prevents people in this country from having reduced access to nutritious food.

As I analyze these informational facts connected to India, it is reinforced that India has very poor water and sanitation. Most people do not have access to a toilet. During my research I noted that 700 million people do not have access to a toilet at home, this creates challenges for families and for the environment because it causes pollution of land and water. Another informational fact that concerns me is that less than 50% of people in India have access to running water. This issue causes additional problems with illnesses because people are not able to properly clean their hands. India is actually one of the least sanitary countries in the world. It's really hard to have enough running water for them because of overpopulation in their country and over-contamination of chemicals such as fluoride and arsenic. They actually have a term for their water which is referred to as, "at least basic water", meaning the water isn't the most sanitary but it is drinkable. Poor sanitation in India has created additional challenges. Poor sanitation is

responsible for stunting 65 million children. It does affect everybody's life expectancy. In my research I found that 1 in 10 people die from poor sanitation according to (Economist, A.A.K., 2017.) Every day it gets worse and worse because they do not have up-to-date sewage systems and do not have enough toilets for people. It affects both rural and urban populations, rural more because the waste ends up traveling through the rural areas from the city rivers.

As I continued my research, I found in an article titled, *Strengthening Sustainable WASH Program,* presented by UNICEF (United Nations Children's Emergency Fund), hopeful practices concerning water and sanitation. I found it interesting that UNICEF was founded in 1946 which makes it seventy-five years old in 2021. In this article it stated,

> India has made rapid progress in ending open defecation across the Country which is having a huge impact on improving water, sanitation and hygiene (WASH). Just a few years ago, in 2015, nearly half of India's population of around 568 million people suffered the indignity of defecating in fields, forests, bodies of water, or other public spaces due to lack of access to toilets. India alone accounted for 90 per cent of the people in South Asia and half of the 1.2 billion people in the world that defecated in the open.
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> By 2019, according to the latest estimates, the number of people without access to toilets has reduced significantly by an estimated 450 million people. A tremendous achievement, only possible because of the *Swacch Bharat Mission* (SBM) (Clean India Campaign), led by the Prime Minister. UNICEF has been a proud partner of the *Swacch* Bharat Mission.

In this same article it stated in a photograph description, *''Pooja Namdev fetches drinking water supplied by the 900W solar panel which fills up a 5000L tank for 27 families in Kalajahi Thakar Vasti in Kanesar village, Khed, Pune.* (UNICEF, 2021) I find that because it mentions solar panels, there is a place for new technologies in India. Organizations such as UNICEF, can be part of the solution to the challenges related to water and sanitation that India faces. Anytime there are new technologies utilized, people may need to be convinced that they can help the citizens. Leaders in India can learn from other countries on how technology is being used and being helpful. For example, Dupont Water Solutions uses a number of different technologies to purify water. One of these technologies is identified as reverse osmosis. In Dupont's Water Solutions technology description, they describe reverse osmosis as:

> Compared to traditional filtration technologies that rely on a screen or filter to remove particles, reverse osmosis (RO) is a pressure-driven separation process that employs a semipermeable membrane and the principles of crossflow filtration.
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> Reverse osmosis water treatment provides the finest level of filtration. The RO membrane acts as a barrier to all salts and inorganic molecules, as well as organic molecules with a molecular weight greater than approximately 100. It is therefore a highly effective process for removing contaminants such as endotoxins/pyrogens, insecticides/pesticides, herbicides, antibiotics, nitrates, sugar, soluble salts, and metal ions.

Recognizing advantages to technologies, such as reserve osmosis, can be a very important part in convincing people to accept these types of advancements for benefiting people. Another type of technology that is being used by Dupont Water Solutions is OxyMem. OxyMem is described as a

> patented, bubble-less transfer of oxygen, designed to emulate a natural respiratory system, can provide simultaneous nitrification and denitrification to increase total nitrogen removal, energy savings up to 75%, reduces sludge by up to 50% and decreases your plant carbon footprint, when comparing with traditional CAS systems, with no additional infrastructure needed.

This is another example of advancements in technology that can help improve water and sanitation. Education can serve an important role in informing people about different technologies and their advantages. When a citizen of India learns about a new technology, they should participate in conversations with others to help with the idea of accepting and using new technologies.

It is going to take multiple solutions to address India's water and sanitation challenges. My first recommended solution would be filter straws to purify water for people. Companies could use recycled plastics to create them which would limit some waste in their production, and then they can clean the fibers and sanitize them for another use. A policy connected to filter straw use would be that you return your old one to get a new one. With the recycled filter straws they would re-use the plastics. It could possibly be funded by the government for less of a cost being in bulk. There are always barriers to proposed solutions. Any time there is a new process there are funding challenges when it involves products, such as filter straws, and a system, such as recycling. Funding challenges can be overcome by forming a long-range financial plan.

A long-range financial plan can be set up for a period of ten years. In these ten years the government can gradually be setting aside funding for the purpose of improving water sanitation. The filter straws and related recycling system can be part of this long-range plan. There is a greater amount of success when there is a plan in place. It is important for the citizens of India to communicate with government leaders about their water and sanitation concerns. While communicating with government leaders, it can be suggested to highlight the advantages of filter straws. Using filter straws, through a long-range plan, can be very effective as these straws will be providing water at a higher sanitation level. This will have positive impacts on the citizens of India in regard to their personal health.

According to (Sharudenko, 2020) around 80% of India's water is severely polluted because people dump raw sewage, silt and garbage into the country's rivers and lakes. This is a big problem that needs to be solved. My second recommended solution would be to dump waste into waste-handling plants instead of into the rivers, and then compost elements that can be composted. To clean the water they could install water purifying plants alongside the river. After all this is done they could bring back the fish species in their rivers which would then serve as a stronger food source. A third solution involved India's government. They could discourage dumping waste into their river by posting reminder signs throughout the different communities. This solution may be met with some barriers. Possible barriers would be cost, labor, materials, and overall organization of the placement of these signs throughout different communities in India. Anytime there are barriers people need to think about possible solutions to these barriers.

To pay for all of the expenses a non-profit organization could be started while educating the India people. Their motto, “Save India Waterways”, could remind the citizens of India that it is a country-wide goal. This would emphasize to save India's environment and restore it to a healthier condition. An added bonus would be the improvement of rivers which would result in bringing back the fish to a greater population which would create more jobs while helping feed the people of India.

In my research I found a website connected to The Borgen Project with an article titled, *“10 Facts About Sanitation in India”.* Within this article it stated,

> The Ganges River provides water access for around 400 million nearby dwellers, and unfortunately, cities directly inject over three-quarters of untreated sewage into the river. The government approved Namami Genge program has achieved the operation of 75 sewage treatment plants, a river surface cleaning action plan and a desire to rejuvenate the river from heavy pollution.

This is certainly another sign of hope and all people need hope. In the beginning of my paper I stated that the population of India is 1,380 billion people. Steps need to be taken to make sure that everyone in this large population has access to clean water. Teams of scientists need to be formed to survey and monitor all areas within India, to identify if there are any citizens unable to have access to clean water and sanitation. For those that may be identified, action steps would then need to be taken to correct it.

As I mentioned previously, it is going to require a number of solutions to help improve and correct the water and sanitation problems of India. To address the possible barrier of labor the citizens of India could volunteer. They can be encouraged to volunteer by pointing out the advantages of the signs that would be placed in their communities. These signs could be made of recycled material already existing within India. Individual citizens of India could be encouraged to use their artistic abilities while designing these signs. These signs could be placed in different communities where large groups of people gather. This would promote the message of the signs. However, community leaders would need to be selected to help organize a team of citizens to place the signs at important locations within their communities. When I reflect on the idea of using the motto, “Save India Waterways”, it is going to require avenues of education. To help establish related policies India needs to build on educating their children in the schools, while celebrating progress of India’s waterways. Sustaining this project really lies within the people which is why educating the children is so important to impact future generations.

In summary, India is challenged with poor water and sanitation conditions. People care for other people and our actions need to reflect this attitude. Each country has their individual culture and within the culture can be the action of caring. My personal recommended solutions include filter straws with a recycled plastic system to prevent pollution from forming with the use of these filter straws. Water purifying plants along rivers within the country can be another great solution. Giving attention to fish species, within these rivers, as a sustainable food source can serve as part of the answer to these challenges. I did mention the placement of signs reminding everyone to “Save India’s Waterways” by being creative with materials that this country already has to make the signs and encouraging people to share their talents to create the signs. These recommended solutions can involve people from all age groups and help people’s health in all age groups.

Signs of hope for improved water and sanitation in India include the *Sustainable WASH Program* through UNICEF, the use of solar panels to help fill water tanks, riverways that have the potential to supply water and aquaculture food sources, and the construction of sewage treatment plants.

I have personally, not travelled, to India but through my studies I have learned that they have challenges with water and sanitation. I can help make a difference by creating a greater awareness of the challenges that India has and encourage others to do the same. When water and sanitation are improved and the difference is recognized by people, it becomes a motivation to be better in other areas where people's lives can be improved. All of us need to work together to "Save India's Waterways."

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