

Brianna Wood
Anamosa High School
Anamosa, Iowa
India, Factor 9

India: Improving Water Quality to Decrease the Amount of Poverty Throughout the Country

India is located in the south of Asia, home to about 25 percent of the world's hungry poor (World Food Program). It is home to more than 1,065,070,607 people (Facts About India). This is about three times the total population of the United States, even though it only has about one third of the total area that the United States covers. However, even though India has a huge population, it only has access to about four percent of any freshwater resources (Facts About India).

The average family in India consists of about five people (Indian States and Rankings). However, many people prefer to live in a joint family. A Joint Family is where three or more generations live together in the same house and share everything, including, but not limited to responsibilities, income, and chores. A household can consist of two people or more than twenty people (Indian States Ranking). The women are responsible for taking care of the home and children. Most families find religion to be very important, so they make time to worship at least once a day. Some families are slowly changing the family structure and pulling away from tradition. Instead of living as one big family in one house, they are beginning to live with their own individual families by themselves while still living very close to the rest of their extended family in small little clusters. The family is still close and can help out with any type of problem that occurs. This type of family structure is called a nuclear family.

The people in India enjoy eating spicy foods and sweets along with the many crops that are grown throughout India. India is famous for many agricultural products including rice, wheat, corn, beans, sugar cane, and oil seeds. In fact, India is the largest producer of sugar in the world (Indian Crops). Raw cotton is also very commonly found throughout the country. India may be good at producing agricultural products; however, the country faces many problems every day. One of the biggest problems in India that is continuing to get worse each year is the water quality. Clean fresh water is needed for survival of all living things. Unfortunately, it is a huge problem in India. Around 37.7 million Indians are affected by water borne diseases each year (Drinking Water Quality in India).

The average farm size is about one hectare, which would be about the same as a 100m by 100m plot (about the length of one football field in the United States.) The farm size has dropped about thirty times what it used to be just thirty short years ago (Farm Sizes and Incomes). However, about seventy percent of the farmers have an even smaller plot size and this small plot has to be able to produce enough food for the entire family. Keeping the whole family fed with proper nutrition becomes even harder with smaller fields. The poor water quality available added to the difficulty of feeding the entire family puts the citizens at a risk of facing malnutrition.

Nearly one third of India's six hundred districts aren't fit for drinking. To make it worse, seventy percent of India's drinking supply is polluted from sewage waste since over 18,000 million liters of untreated sewage waste enters just the Yamuna River daily, a major water source in India (Poor Water Quality).

Given all of these qualities, it isn't hard to believe that India is ranked 120th out of 122 nations for the quality of water offered to its citizens (Poor Water Quality). Everything that is added from humans to the water sources causes even more damage. If people watch what is added to this river along with all the other rivers, the pollution level would go down, which means the water quality would eventually get better.

Some of the ways the water gets polluted is from people's everyday activities. For example, many farmers don't always think about how the things they put on their crops, like pesticides or even fertilizers, will be harmful if it gets into a water source. Unfortunately, these normally find some way to get into the water. Most manure and about eighty percent of sewage waste end up in a water source (Central Intelligence Agency). Only ten percent of the sewage waste gets treated. The rest just gets dumped into the rivers (Water Pollution Causes-Water Pollution Effects). If the water continues to get polluted, how will there ever be anything fresh to drink or use for other important reasons such as agricultural practices?

Many parameters are found in polluted water. These parameters have very dangerous effects on humans. The first parameter commonly found is fluoride. The immediate symptoms include digestive disorders, skin diseases, and dental fluorosis. The longer the exposure to this chemical, the worse the effects become. If fluoride is consumed in large quantities, such as over ten to twenty years, the results could end with a severe bone damage called crippling or skeletal fluorosis (Drinking Water Quality in India). Another harmful chemical that is found in water is arsenic. The immediate symptoms of acute poisoning normally include abdominal and oesophageal pain along with vomiting. Exposure to this over time may lead to skin, lung, urinary, bladder, and kidney cancer. The skin may also start to change from lesions and pigmentation changes. Iron has a poisoning effect on children and it can cause blood tissues, digestive disorders, skin disease and dental problems (Drinking Water Quality in India). Nitrate is also very common in groundwater. Nitrate can cause Blue Baby Disease where the skin of infants becomes blue due to decreased efficiency of hemoglobin to be able to combine with oxygen. This can also increase the risk of cancer (Drinking Water Quality in India). Another common parameter is salinity. Salinity may affect the osmotic flow and movements of fluids. Heavy metals damage the nervous system, kidneys, and have several other disruptions with metabolism. Persistent organic pollutants increase blood pressure level, and has some hormonal dysfunction along with growth retardation. The last major harmful parameter that is found in water includes all of the pesticides that are used on crops. These weaken immunity, increase a possibility for tumors to form, and contain chlorides that cause reproductive and endocrine damage (Drinking Water Quality in India). This is why it is important to know what goes into the water sources. Preventing water contamination at the source is necessary to ensure that the supplied water stays fresh.

Water quality has also declined from other reasons, not just agriculture and human settlement. Industrial activities have also played a big role in the decline of water quality. Several hundred tons of heavy metals, solvents, toxics, and other wastes are dumped into the water each year. Imagine what all these chemicals can do to someone when that water is consumed (Water Quality in India). Many ecosystems are damaged from the decline in water quality every year, which means that some animals could even be going extinct due to the dramatic change in the quality of water available.

There are many supported programs that teach families how to ensure a supply of safe, clean water in their homes. Most of their tips are actually quite simple. The drinking water is treated with diluted chlorine bleach to start off. This solution should be stored in a narrow-mouthed, lidded vessel so it stored safely (Safe Water). The simplest teaching technique is washing hands with soap and water (Safe Water). India has a Safe Water System that is slowly improving the water quality throughout India (Where CDC Works). However, there is still a lot more work that needs to be done.

There are a few simple solutions that can be used to improve the water quality. The cheapest and easiest way is the prevention of pollution. If there were fewer things that could end up in the waterways, the water would be cleaner. The industry could help by making more products that produce less pollution and use fewer resources. The agricultural industry could help by reducing the amount of toxic materials so that the water sources don't end up with as much toxic waste polluting the water. The second option could be a treatment of polluted water. Waste water treatment facilities kept in good working condition would increase the amount of clean water available to the public. The third way water quality could be improved is by a safe use of waste water. This is where sterile human waste can be applied to plants, which can be a good source of nutrients to the plants. By doing this, the clean water can be used for different reasons instead of producing great crops. The last way is from restoring and protecting the ecosystems. This method uses ec hydrology, which is the relationship between ecological processes and the water cycle (Water Quality in India).

There are several actions that the people of India can take to prevent water pollution. Toxic chemicals should be avoided as much as possible in the home. Paint, stains, and cleaning products can be considered a toxin if they aren't disposed of properly. Cars can also be included in helping prevent pollution just by fixing an oil leak. Another brief activity that the citizens can get involved with is to help clean up the beaches and waterways. Many tourists visit the beaches and leave behind all their waste and litter. This small act of kindness can keep debris and pollutants out of the water (Water Pollution Causes-Water Pollution).

Improving the drinking water has been given high priority in the Constitution of India. It has become the government's duty to provide clean drinking water and to improve public health standards. In 2001, the census reported that about 68.2 percent of households have access to safe drinking water (Drinking Water Quality in India). However, if the water sources are continually polluted, India will be considered a "water stressed state." This is where the country won't have a high enough amount of safe drinking water needed to provide everyone the right to safe drinking water. Sanitation access has also started to improve. In urban areas, about 54 percent of the population has gained improved sanitation access and in rural areas about 21 percent of that population has improved. However, this is only about 31 percent of the total population that has improved the sanitation access (Central Intelligence Agency). There is still a lot more room for improvement in the 46 percent of urban areas, 79 percent in rural areas, and 69 percent in the total population that have remained unimproved (Central Intelligence Agency).

Many of the poor people in India lack a high level of education, have inadequate health care, and have extremely limited access to social services (Rural Poverty Portal). However, the people that can afford health care generally receive very high quality at a low cost. The government is currently working on adding more services to improve the quality of care the poor receive (Access). Sadly, women are the

most disadvantaged people in the Indian society. Poor nutrition and access to health care is a huge factor in child mortality (Drinking Water Quality in India).

Most of the agricultural practices in India are confined to the few monsoon months. So, water-management practices are also very important. Often, monsoons don't have an irrigation facility nearby which normally leads to crop-failure and low agricultural productivity. This can force a farmer into debt. Then the family would have to move into a city where the resources available would be even less than what they originally had available to them (Poverty Rate in India). So, with an even smaller amount of water that is available, less amount of food can be produced. Whenever the monsoons dry up a drought occurs. People now have to worry about where their next meal will come from as well as where they can get fresh water. Without the monsoons, the crops don't get as much clean water needed to grow properly; which results in less outcomes.

It is sad to even think about how many people in India alone are below the poverty line and not getting as much to eat as they should. There is plenty of food throughout the world to feed everyone. No one should have to worry about getting enough food to barely get by. With everyone's help, we can reduce the amount of poverty just by adding small daily activities in our lives to help improve the water quality available. The biggest intervention is to watch the amount of pollution that is happening throughout the world and stopping it before it gets into any water source. Even better, prevent pollution from happening as much as possible. If more of the water sources are clean, mainly pollution free, then countries wouldn't have to worry when they will be able to have fresh water again. Another activity everyone around the world can do to help with India's water struggle is just simply conserving fresh water and not wasting it as much. If we can find a way to share fresh water with countries that really need it, then this wouldn't be very high factor in the poverty rate anymore. Monitoring stations could even be set up in India and water should be tested on a more regular basis.

A monitoring station is where specialists sample the condition of the water, looking for anything that could be harmful. This could include how much oxygen is dissolved or what nutrients, metals, oils and pesticides are found in the water (An Introduction to Water Quality Monitoring). The Central Pollution Control Board has made a large network of monitoring Stations all across India. The present network is made up of 870 stations in 26 states and 5 territories (Water Quality Monitoring in India). Most monitoring is done either monthly or quarterly on surface waters and half yearly for ground water. The monitoring network covers 189 rivers, 53 lakes, 4 tanks, 2 ponds, 3 creeks, 3 canals, 9 drains, and 218 wells (Water Quality Monitoring in India). These stations are slowly increasing; however, they still have a few things to work out. The water has to travel too long of a distance to the monitoring station for the results to be completely accurate also the preservations of samples placed in the water are critically affected by the weather conditions. Another factor that affects the results is the lack of software to analyse the data for trend analyses and data validation (Water Quality Monitoring in India).

Sharing fresh water between countries is possible. It requires a huge amount of cooperation from every country involved. There are currently 276 international basins that allow countries close to each other to share fresh water. These basins only cover about forty-five percent of the Earth's land surface, supplying nearly forty percent of the world's population fresh water (What is Water Cooperation). China recently built a 66 billion dollar canal and pipeline to bring freshwater from the South to the North. Adding this

changed the life of the people in the North. The children that once had to walk all day to fetch clean water can now go to school in the afternoons because they don't have to worry as much about getting fresh water to drink (Ned Breslin: an Inside at Water). They don't have to walk miles each day to go get the fresh water anymore. Imagine what adding a canal or pipeline to India could do. The lives of the Indians would be changed greatly.

Eventually the water quality available to the public would increase greatly. This could increase the water quality rating. Adding a basin, canal, or pipeline would be very expensive; however, it would end up being very cost effective in the end. India would be one step closer to achieving its goal of providing clean drinking water for everyone. India could manage to find funds to put this plan into action by investing in an agricultural product. China invested in coal fields in Australia and food production in Africa to help with the cost (Ned Breslin: An Inside at Water). Maybe an idea like that would work in India.

India, Bangladesh, and Bhutan had a meeting about sharing water and power just recently. This meeting is expected to enhance cooperations among countries that share common waters. It is also expected to explore possibilities of a common basin management of common rivers (NEALLIANCE). This meeting will help other countries see that India would be greatly benefitted by sharing water. This meeting was a big step to fresher water for India.

The communities in India and all around the world should start more programs to control the pollution problem. A good idea would be to create a program similar to the city of New York. New York City's Wastewater Treatment System requires industries to remove specific toxins from their wastewaters before it is released into the actual sewer system. From doing this, the rivers and groundwater won't have as many dangerous chemicals in it that can harm people. This would help protect the sewers, the wastewaters, and the city's receiving water; altogether, improving the quality over time (New York City's Wastewater Treatment System). Fewer toxins added to the water means the monitoring stations won't have to spend as much time cleaning the water. Over time, these little things can create a lot more safe water for India, just like it did in New York City.

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