Alina Pargamanik

TSEM 190.002

Prof. Fehskens

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What Can Be Done? – Delhi's Water Conservation Initiatives

Have you ever counted how many times a day you flush a toilet? Try it one day – you might be surprised to see that the number is much higher than expected. Now think broader. How much water do you use each day on other activities such as showering, washing dishes, or doing laundry? The amount of water you use starts to add up exponentially. Unfortunately, while living our daily routine lives, many of us do not even begin to think about water consumption. This holds especially true for those living in urban areas. While we are so focused on our daily lives, we tend to ignore one of the most important aspects of life – water. Water consumption in urban areas tends to be very high, but this use of water is much more noticeable in some areas compared to others. In the United States, the abundance and inexpensiveness of water is what makes it a so-called "invisible" part of life. In areas where water is harder to find, such as Delhi, India, water holds a key role in the daily lives of civilians. In fact, "73% of the households have piped water supply, 14.3% depend on community taps, and the rest depend on tube-wells and tankers" (Ghosh 2). With the piped water supply, the water only reaches civilians at certain points of the day in very limited amounts. What these percentages really show is that people in Delhi have to physically go out of their way to get water for their families everyday. Local bureaucracies in Delhi have tried to take initiatives in promoting water conservation, but the results have not always been the most efficient. People simply do not want to give up their

current water consumption norms, and unprecedented urban growth is making it difficult for local governments to keep up with the issue. Although local bureaucracies in Delhi, India are implementing new initiatives to address their water issues concerning availability and value, the initiatives currently in place are not enough to withstand the unprecedented urban growth of the city and the high number of poverty level residents who cannot afford water.

In his exploration of water usage around the world, *The Big Thirst*, best-selling author Charles Fishman points out the flaws in India's water management. "It has enough water, it has more than enough smart people and more than enough resources. What India doesn't have is a culture of taking water seriously – water, water service, and water management" (Fishman 224). The root of the problem here is not nature's fault and it is not the civilians' fault either – it is the government's fault. Fishman makes a very valid argument that there are many issues concerning water management and usage in India, but he puts the blame on the culture more so than the local government. Local water officials should have started coming up with ideas on how to conserve water long before this water crisis occurred. It was their responsibility to make sure efforts were made to conserve water in case of a situation such as unprecedented urban growth. Blaming Delhi's water crisis on culture is simply unproductive and meaningless. Many citizens of Delhi are already consuming water at the bare minimum, sometimes even below that. Unlike in the United States, water is a highly visible and valued resource in India, so individuals actually take the time to consider how much they are using and how they are using it. It is the government's role to intervene in this situation to make sure that the water is being distributed properly to the residents of Delhi. According to Fishman, most major Indian cities had 24/7 water distribution to all well into the 1970s and 1980s. So what happened? Simply put, the

initiatives to control the water problems were not put into action in time, and the ones that are now in place are not enough to control the water problems Delhi faces.

Delhi's demographics and environment offer particular challenges to water conservation initiatives. Delhi has a current population of approximately 16.8 million, making it a fairly large urban center. According to Delhi's 2014 census report, the per capita income for Delhi was Rs. 219979, the second highest in India (Sharma 4). Converted to dollars, this is only about 3300 dollars per year. While Delhi does have one of the highest per capital incomes in India, it's total slum population in 2014 was 1785390, that is approximately 10% of the total population (Sharma 23). In other words, many of Delhi's residents do not have any means of affording the expensive price tags on receiving adequate water supply or paying the fees and taxes associated with improving the technology needed for proper water distribution. While the city is predominantly residential, it still has a "significant amount of commercial spaces and some industry, mostly in the form of small and medium enterprises" (Ghosh 2). These commercial spaces are also very large consumers of water for the area, and because businesses tend to have more financial stability than individuals, local government officials should try to push as much cooperation out of these businesses to support water improvement in Delhi for both the industries and their consumers who live in the city.

Delhi does have a major water source running through the city, the Yamuna River, but it is extremely unsanitary and unsuitable to be used for human consumption. The river is so polluted that available wastewater treatment facilities are simply not capable of removing such a capacity of pesticides (State of the River Yamuna). The vast agricultural fields at the upper portion of the river are mostly to blame for the river's pollution. Unfortunately, with Delhi being located at the lower portion of the Yamuna, it is left acting as a sewer for all the pesticides and

pollution coming from upstream. Since this is the only major water source near the city, it would make sense for residents to be able to use it as a readily available source of water, but with the river's current state, that is simply not an option. Thus we are left wondering – would make more sense to start at the root of the issue and limit the amount of pollution being emitted by the agricultural fields at the upper portion of the river, or should there be more initiatives in place to improve the current wastewater treatment facilities? Some may argue that agriculture is primarily to blame, and they are not entirely wrong. Agriculture does contribute to a very large portion of water pollution and inadequate water usage, but in this case the best solution would be to improve the city's technologies with treating the polluted water. Although Delhi still has a very high number of residents living below the poverty line, that percentage is still much higher than that in rural areas. Thus, people in Delhi are more likely to take on the financial burden of paying for wastewater treatment than those in rural areas.

It is commonly believed that agriculture is to blame for water issues, but as we can see with Delhi, that is not always the root of the problem. Because of the lack piped water supply and community taps, families are forced to take time out of their daily lives to get water from tube-wells and tankers. The most unfortunate part about this is that the water they do get is the very bare minimum because water is, well, not as light as feathers. The issue with obtaining clean drinking water is particularly applicable to low income families who simply do not have the finances available to afford housing with tankers or wells that bring water directly to their doorstep (Ghosh 2). Because men are considered to be the ones who are supposed to earn the money for the family, the boys' education is valued far more than the girls'. Thus, the girls are the ones who end up dropping out of school to be in charge of getting water for their families from the tankers, which are usually miles away from their homes. Fishman writes, "Girls don't

go to school because they have to fetch water. Girls drop out of school because the schools have no working bathrooms" (Fishman 246). In other words, the girls cannot win. If they stay in school, their families will not have water and they will have no means of accessing a restroom during the day. If they drop out of school, they lose their education. After weighing the costs and benefits of each, for most girls in Delhi, the clear choice is to drop out of school and fetch water for their families. Unfortunately, many of these girls also do not fully understand the value of a good education. With the proper education, many of these girls would be able to not only potentially help solve the water issues in Delhi, but possibly provide opportunities for their families to move to areas with better water distribution. With a proper education, these girls could become the local government leaders Delhi needs to push the proper initiatives concerning water into place. But why is the current government not concerned that the literacy rate among females in Delhi is a mere 53.7%, with some slums having a rate as little as less that 3% (Sharma 5)? The answer lies in the disillusionment amongst these government officials as to why these girls cannot attend school. Government officials make up the top percentile of incomes in Delhi, so their children most likely do not have to walk miles to fetch water. Those living in slums, on the other hand, have to make their children, particularly girls, give up their education and any possibility of establishing a life outside the slums simply to fetch water for the family to survive on a daily basis.

According to recent studies, Delhi has "lowered its water consumption but increased its electricity consumption" (Ghosh 7). People are using electricity to cope with the lack of water supply. For example, many are switching over to electric appliances such as dishwashers and washing machines to save time and decrease water usage. As Fishman points out, "people are so focused on electricity that they're ignoring water consumption" (Fishman). Using these electrical

appliances to conserve water is great, but we must not think that simply doing this will rid us of all the water issues Delhi faces. The disposal methods of those appliances is something that also needs to be considered. Without proper disposal, all of those electrical appliances will release chemicals that could leach into the groundwater which ultimately ends up in the water sources that Delhi crucially needs, such as the Yamuna River. On a similar note, the sulfates and other chemicals found in various cleaning materials can have the same effect on the groundwater if they are not properly removed from the water supply. Furthermore, low income families do not have any means of affording any of these electrical appliances, so their water usage is still very high.

Despite all the water issues Delhi continues to face, its local government and bureaucracies are testing and implementing new initiatives to try and solve these issues. One of such initiatives is the experimentation with the idea of the government "supplying water to people at subsidized prices to meet the basic needs and at higher prices to meet other needs beyond the basic needs" (Ghosh 1). In other words, all water that is considered necessary for basic needs will be subsidized at low costs by the government and any extra use will be made very expensive. What the government is trying to do with this is limit the amount of water usage among all income levels, while still making water affordable for low income families as a human right. This plan sounds ideal, but with any new plan there are still many factors that could be overlooked by the government. Such a program would require very high-quality data on water consumption across all of Delhi, and such data is simply unavailable, especially in low income slums where this type of information matters the most. In Delhi, "water meters are rare, and smart meters are unheard of" (Ghosh 2). These meters could be used to measure water consumption and record data that could be used to determine the subsidized prices. Because of

the lack of water consumption data, there is no way of truly figuring out a real number that would be considered the line of what "basic needs" should be considered.

Although low income families face the biggest challenges concerning water in Delhi, the middle and upper class are not faring as well as their American counterparts. Fishman interviewed Vikram Soni, a retired theoretical physicist living in one of the most upper class neighborhoods of Delhi about his water experiences, and they were not the best to say the least. When asked about the water in his house Soni responded, "Once or twice a week, the water comes on in the pipeline" (Fishman 221). Not only does this show the unreliability of Delhi's piped water supply, but it also shows that everyone of all incomes struggles with water in this urban city. The wealthier civilians do have some advantage though; they can afford better technology for personal use. Soni, for example, has a pump to keep water flowing, but these are technically illegal and, thus, very expensive (Fishman 221-222). These pumps are illegal to avoid water cartels forming in the region. The government does not want water to be privatized by a few individuals who have the financial means of extracting groundwater through private pumps. This is where Fishman's culture argument comes into play. This shows how the upper class has so much control in Delhi, that they are able to withstand laws established by the government. So the question still remains, why hasn't Delhi's government come up with any solutions yet to both enforce their current laws and enact new laws to solve the water issues?

In recent years, India has actually attempted to solve the issue of not having enough data. In April 2009, India's Supreme Court ruled that the central government must find a solution to the nation's water issues by establishing a water committee. The ruling particularly states, "The Committee is directed to do scientific research *on a war footing* to solve the water shortage in the country" (Balakrishnan 5). It is easy to tell that the Supreme Court is not playing around with

this ruling with the clear, bold, underlined emphasis on "on a war footing". This is no longer just a water conservation task for India, but rather a war on its water problems. This committee that the Supreme Court ordered the central government to create would be in charge of finding "inexpensive ways of converting saline water into fresh water…managing monsoon rain water…research in rain water harvesting and treatment of waste water…" (Balakrishnan 5-6). For Delhi, rain water harvesting and treatment of waste water would play a crucial role in promoting water conservation without having people to change how they use water on a regular basis. The Yamuna River is far too contaminated for the water to be converted into clean drinking water, but Delhi does experience monsoons and heavy rainfall which could provide tremendous relief for the city if this water is harvested properly.

One of the downsides of harvesting rain water would be money. "Water related infrastructure in cities has high capital and operating costs" (Ghosh 1). You simply cannot harvest rain water properly without the proper infrastructure, but to get this technology in place, you need to have the finances. The only way Delhi could afford to put such infrastructure in place would be through fees and tariffs that, unfortunately, the majority of poor civilians just cannot afford. If these people are going out and walking miles to fetch water that they barely get enough to live off, they will more likely than not be very opposed to the idea of paying a fee that may or may not actually get them the water they desperately need. Relying solely on the upper and middle class is also not an option in this case. Delhi's population is predominantly low income, and the small percentage of higher income civilians would not cover the costs it would take to put such infrastructure in place. As Fishman points out, "Poor Indians don't have the power to demand improved water service, and fear they might not have the money to pay for it" (Fishman 259). People would much rather keep the difficult, yet safe route of knowing they will

get at least some water by going out of their way to get it rather than having to pay extra for it and not knowing if they will actually be able to afford it. Water is a necessity to life. People living in Delhi's slums need water just as much as those living in the city's prestigious neighborhoods. Unfortunately, those living in slums have no means of shedding out even a few cents more to possibly improve the city's water technology. And with Delhi's recent trends of improving water infrastructure, you can not blame them. The government has been very slow and inefficient in bringing about any significant change to the city's water infrastructure. The other downside of harvesting rain water is Delhi's climate. Delhi does experience dry and wet seasons, so rain is not constant. Rain harvesting would only really be beneficial for the wet season, and that brings us back to the financial reasoning – is it worth it? Is it worth spending all that money on harvesting infrastructure only for a few months out of the year?

Arguments have also been made that the government in Delhi is not to blame for the lack of initiatives it provides towards water conservation. Kaushal Misra, a professor at the Institute of Management Technology in India, states, "The Government of India supplies sufficient amount of water to its people but due to lack of proper infrastructure of pipes, etc. there is leakage and people suffer shortages of water…" (Misra 32). Misra claims that the entire supply and demand issue is man made and that people should be willing to pay the costs to get good infrastructure and clean water. While it is understandable that nothing great in life comes for free, we need to recognize that a very large percentage of Delhi residents are living below the poverty line. These people do not have an extra penny to spend for infrastructure that could take years to develop.

Misra does make a solid argument towards the use of sewage treatment plants, or STP's, in Delhi. Almost all of the sewage Delhi collects gets dumped into the Yamuna River, which is

how it became so irreversibly contaminated and polluted in the first place. According to Misra, "With the help of STP the waste can be treated and that water although not usable by households can be sent to industries for their usage" (Misra 32). Misra makes a very good point emphasizing that this treated water will not go back to households, since it is still not suitable for human consumption, but that does not mean it cannot be used by Delhi's industries. And as stated previously, Delhi does hold a fairly large amount of commercial and industrial enterprises. This is important to acknowledge when looking at an urban city like Delhi because much of India is rural where the majority of water consumption is taken by agriculture. The only issue that comes out of the use of these sewage treatment plants is, once again, money. Who would be responsible in paying for the construction of these plants, and how would the plants be funded for future operation?

Delhi's government is clearly making efforts to resolve their water crisis, but many issues remain unaddressed. Unprecedented urban growth is causing the government great difficulty in trying to control water distribution to all residents. Children, particularly girls, are still giving up their education to provide water for their families. Technology, such as rain harvesting and smart meters, is advancing, but the costs are much too high for the largely low income population of Delhi to afford. With a stable supply of water, many of Delhi's residents could live cleaner, healthier lives allowing them to be more productive citizens, and thus making Delhi thrive more than ever as a commercial and industrial urban center. With more people being able to get an education without having to worry about fetching water for their families every day or week, the unemployment rate is sure to decrease, and more residents would have the possibility of stepping out of poverty. With more residents coming out of poverty and into the work force, Delhi could

once again rise to the prospering city that it was forty or fifty years ago prior to the significant downfall of its water distribution methods.

Living in the United States, how many times a day do you really think about your water consumption? Slightly to none at all, right? And look where we stand – very high literacy rate, very high life expectancy, fairly low poverty rates compared to other nations, etc. If the residents of Delhi could have even just one thing less to worry about, that thing being water, all of these numbers could go up exponentially for them as well. Fishman very accurately describes how the lack of water affects Delhi citizens by stating, "People are literally captive to the daily task of fetching water – their ability to go to work, to send their children to school, to get a full night's sleep, to be healthy, all hostage to the schedule on which the water is available…" (Fishman 221). With the right water committees already set up, it is time for India's government and Delhi's local government to step it up and budget out money towards water conservation initiatives in ways that would not increase the financial burden on already financially struggling civilians, either through imposing fees only on taxpaying residents or relying on large businesses and commercial spaces in the area to pay a portion of those fees.

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