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Inequality in India: Through the Lens of Differences in Water Quality

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ABSTRACT

India is ranked as the worst country in the world, in terms of number of people lacking access to safe water. This study examines the socio-economic inequity of India through the lens of privileged Indian respondents' perceptions of the water quality accessible to communities of different socio-economic status. To address this aim, a survey was conducted to measure the level of social awareness around this issue among privileged Indian respondents with regards to their ratings of the safety of the water in three different communities: their own, the underprivileged, and India as a whole. Respondents rated their water quality to be the highest, followed by India as a whole, and then the underprivileged. The main reasons they offered for their ratings were: the government's failure to set up an adequate infrastructure for piping water without polluting it and the inability of the underprivileged to afford water filters in India. Despite the gravity of the health problems that can ensue from the lack of access to safe water, the lack of accountability for the government, and apathy from the privileged residents, can be attributed to the deeply entrenched discrimination in India, which is founded upon its caste tradition and its pursuit of the capitalist agenda in the '90s. Therefore, it is vital that the Indian government and people take responsibility for providing safe water to all by increasing awareness amongst all communities, provision of water filters for all, and the eventual changing of the piping system in the long term.

Introduction

A chief manifestation of socio-economic inequity is the difference in water quality available to communities on opposing ends of the socioeconomic spectrum. According to the World Health Organization (2019), safe drinking water, what should be a human right, is denied to over two billion people in the world due to socio-economic inequities. Furthermore, water safety is becoming an increasingly pressing issue, with two-thirds of the population predicted to have trouble accessing enough water by 2025 (World Wildlife Fund, n.d.).

Unsafe water is a serious threat to society. Through repeated exposure, people risk contracting diseases like cholera, diarrhoea, dysentery, hepatitis A, typhoid, polio and more (World Health Organization, 2019). To top it off, the outcomes of these medical conditions are often exacerbated by the reality that affected communities living below the poverty line would typically lack the wherewithal to combat them (Barik & Thorat, 2015).

Among the countries in the world afflicted by unsafe water, India — a developing country with the world's second largest population — was ranked as the worst country in 2015 by WaterAid (2018), in terms of the number of people lacking access to safe water. As a country greatly afflicted with poverty, based on having "the largest number of people living under the international poverty line" (Press Trust of India, 2015, para. 1), which is USD1.90 a day, India has a sizeable number of people who are affected by the unsafe water crisis.

As a high schooler living in Gurgaon, I have become acutely concerned about the plight of the underprivileged communities who lack access to clean water. While Gurgaon is arguably one of the most developed cities in India, around 16% of its population call slums home ("Census 2011", 2011) . Therefore, it is likely that many in the

very city I live in suffer from having to drink unsafe water. Nonetheless, no research study had been produced concerning the issue of safe water in Gurgaon within the context of socio-economic inequities. To address this gap in the research discourse, this research study was conducted to shine a light on the topic of socioeconomic inequality by examining the perceptions of privileged Indian respondents living in Gurgaon regarding the safety of the water in diverse contexts.

Review of Literature

Being one of the largest issues plaguing India, with 21% of the country's diseases being brought about by water contamination (Snyder, n.d.), this is not a new topic and much dialogue and research has taken place regarding the crisis. Majorly, the blame is often placed on the Indian Government, along with a combination of other factors such as overpopulation, poor investment in infrastructure along with the over-exploitation of groundwater.

According to the 2011 census, the Indian population sits at just over 1.2 billion. This results in the amount of water per person being 1,000 cubic meters, when one uses the higher end estimates (Parikh, 2013). A country is considered to be water stressed if the amount of water per person is less than 1,700 cubic meters per person, making India the world's 13th most water stressed country (Pandey, 2019).

While the Indian Government has made big promises about working on the water calamity their nation faces today, much of it seems to be empty words as no budgetary increase can be seen (Sleet, 2019). This claim holds water when one looks at the condition of many initiatives taken by the government, case in point, the National Clean Ganga Mission. This mission was made with the purpose of creating an impact of the horrendous this river is currently in. However, little progress has been made, as today none of the towns that this river touches has water clean for both bathing or drinking, despite much government investment (Sleet, 2019). Additionally, some reports claim that the National Ganga council, that is responsible for this project, has not met since 2016, the year when it was created (Sleet, 2019).

Agriculture is a major culprit in this emergency that looms over India. 90% of all groundwater is used for the purpose of agriculture and the production of food - with India being the world's largest consumer of groundwater (Jain et al., 2021). This excessive strain on groundwater is a growing threat to potential agricultural problems in the nation, and unfortunately, government interventions have been deemed inadequate due to the sheer intensity of the problem at hand (Jain et al., 2021).

My research is a new addition to this field, as I delve into how socio-economic inequity and caste plays a role in India's water crisis. This will be studied using the opinions of privileged residents of Gurgaon, India - one of the emerging metropolitan cities of the nation. Both qualitative and quantitative data was collected by asking them to rate water quality and safety amongst different Indian communities according to them, and asking for their reasoning for such ratings. To maintain privacy, no names of respondents are mentioned.

Methods

Research aims and approach

The aim of this research study was to conduct an in-depth and focused analysis of socio-economic inequity in India through privileged Gurgaon residents' perceptions of water quality in communities present in different parts of the socioeconomic spectrum. More specifically, quantitative and qualitative data were gathered to provide a composite picture of the differentials in the treatment of the privileged and underprivileged two communities in Gurgaon, in terms of access to safe water.

Data Collection

An online survey, using Google Forms, was formulated, in which the respondents were asked to rate the safety of the tap water they received in their communities, the underprivileged communities, and India in general, to the best of their knowledge. Open-ended questions were also included to enable respondents to further explain their ratings. The survey was targeted at residents of Gurgaon, India. The survey can be found in Appendix A, and the participation invitation letter in Appendix B.

Data Analysis

Descriptive statistics of the respondents' ratings of the tap water in the three aforementioned communities was conducted. A one-way ANOVA was conducted to determine statistical significance. Finally, a qualitative analysis of the responses to the open-ended questions regarding the respondents' reasoning behind their ratings provided additional insights that further enriched the analysis.

Results

In this section, the results of the analysis of the ratings of water quality, captured from the survey conducted, are presented. The water quality and safety has been rated on a scale of 1–10 by privileged residents of Gurgaon, India, with "1" being the lowest and "10" being the highest.

We begin with the descriptive statistics to examine the respondents' mean ratings of the three communities. As shown in Table 1, the mean rating for tap water was highest for the water in privileged communities (M = 6.28, SD = 2.42), followed by in India in general (M = 4.34, SD = 2.05) and the underprivileged communities places last (M = 2.57; SD = 1.55). There is a 144.35% increase in the rating of privileged communities, compared to the underprivileged ones. Aside from the fact that a difference in the rating shows that the respondents believe that privileged communities have safer water, but the sheer magnitude of difference in these ratings shows a strong portrayal of how the underprivileged community is viewed in Gurgaon.

Table 1. Descriptive Statistics of Respondents' Ratings of Water Quality Across the Communities

	India	Underprivileged communities	Privileged
Mean	4.34	2.57	6.28
Median	5	2	7
Mode	5	1	8
Standard Deviation	2.05	1.55	2.42
Standard Error	0.21	0.16	0.26

To ensure that the results collected from the survey are statistically significant ($p < 0.05$), a one-way ANOVA test was run (see Table 2).

Table 2. One-way ANOVA of Respondents' Rating of Water Quality Across the Communities

Source of Variation	SS	df	MS	F	P-value	F crit
Between groups	600.02	2	300.01	71.88	1.53E-25	3.03
Within groups	1076.73	258	4.17			
Total	1676.75	260				

The one-way ANOVA for the respondents' ratings shows that the results are statistically significant: $F(2, 258) = 71.88$, $p<0.1$ (see Table 2). In addition, an in-depth examination of the distributions of the ratings for the three communities was conducted.

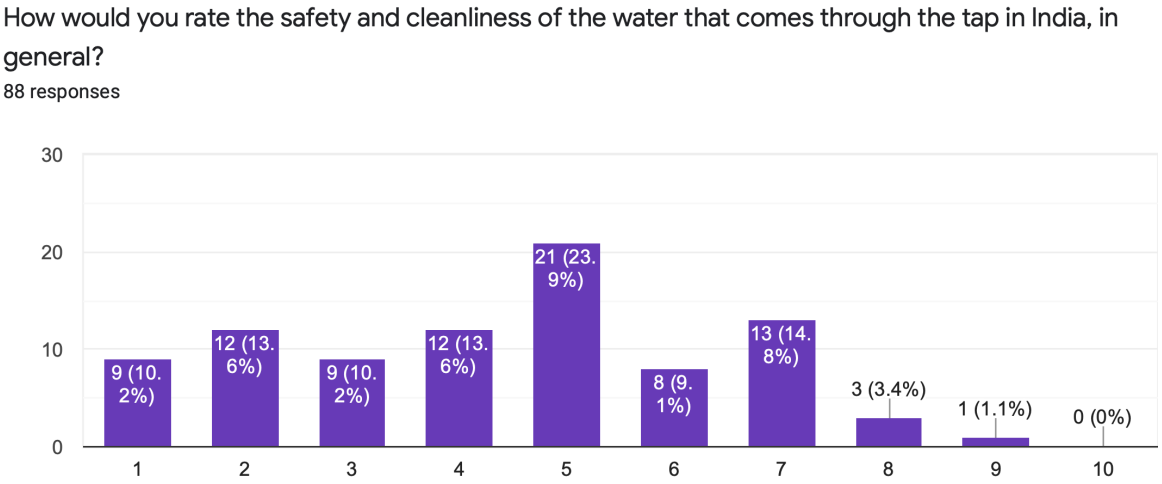

Figure 1. Respondents' ratings of the safety of tap water in India, in general.

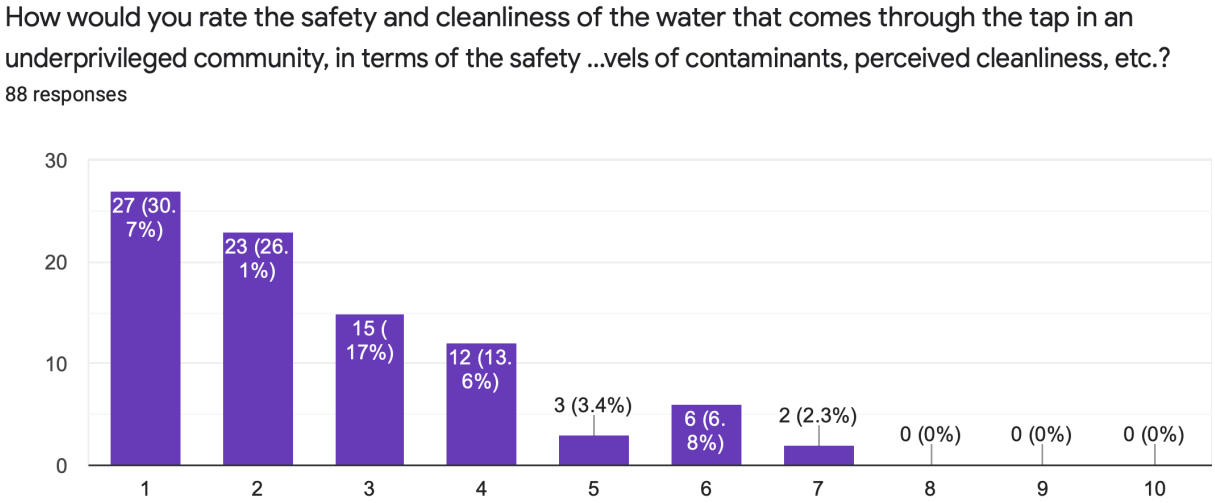

Figure 2. Respondents' ratings of the safety of water in underprivileged communities.

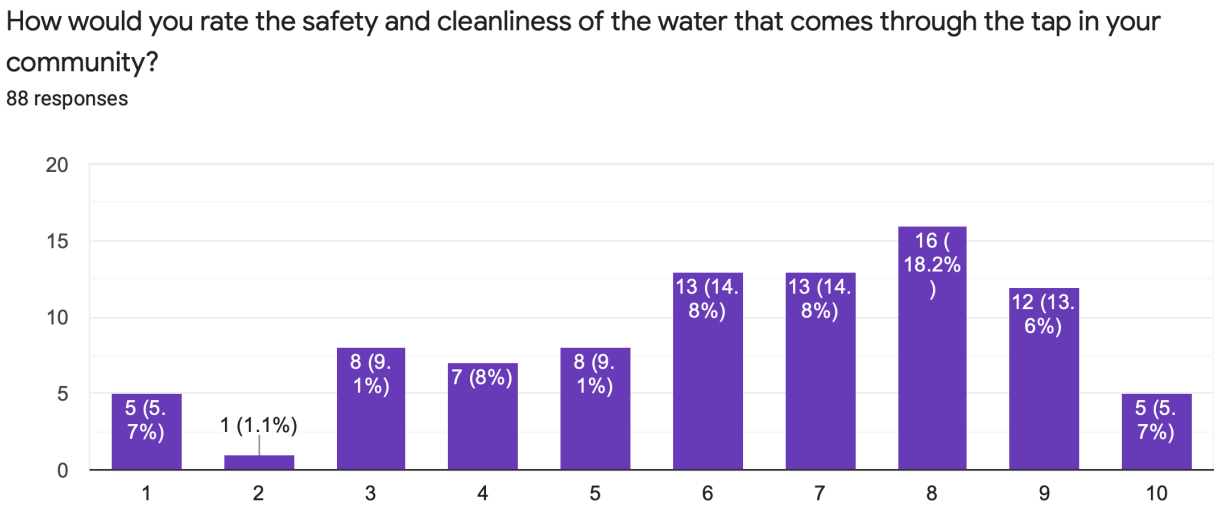

Figure 3. Respondents' ratings of safety of water in their communities (privileged).

When looking at Figures 1, 2 and 3, there are substantial differences in the ratings regarding of the safety of water across the different types of communities being evaluated. Over 70% of the respondents rated the water quality in underprivileged communities a 1, 2 or a 3 with the mode being one which shows the perception of the respondents towards the community's water. Meanwhile, 47% of them had rather the water in privileged communities a 6, 7 or 8 with the mode being 8. However, when the respondents had rated Indian tap water quality as a whole, the distribution of rating was much more complex, not being concentrated on one side. The most commonly occurring ratings were 2, 4, 5 and 7, with 5 being the mode which points towards their not being a clear perception about the water quality in the nation in general, unlike the privileged and underprivileged communities.

Discussion

This statistical analysis of the differences of the ratings between the three different communities with regards to access to safe water provides a damning portrait of socio-economic inequality in India. Even as it reveals the privileged communities' awareness of the disparities in access to safe water, it also illuminates the general acceptance of the status quo. The qualitative explanations provided by the respondents, presented below, offer more in-depth insights into this acceptance. As shown in the quantitative analyses, Gurgaon's privileged respondents' perception of the water quality of all the communities is reflected in their awareness of the disparities in access to safe water between communities. In fact, there is widespread acknowledgement among all the respondents that tap water in India is not safe for drinking. This perception is supported by a report conducted by the Bureau of Indian Standards (BIS, 2019). It found that all the capital cities of India, along with Delhi, had unsafe tap water (BIS, 2019). The only exception was Mumbai (BIS, 2019). India's ranking of 139th out of 179 in water and sanitation on the Environmental Performance Index also confirms the inadequacy of water hygiene in the country (Wendling et al., 2020)

As with other privileged residents in India, the Gurgaon respondents install private filtration systems in their households to ensure safe drinking water, as mentioned by a respondent, "Our communities use filters to purify the water." It is important to point out that the most common type of filtration system used in Indian households, RO filtration, costs anywhere between INR10,000 and INR20,000 INR (Eureka Forbes, n.d.). Given that the average

monthly incomes of rural and suburban households are INR8,391 and INR7,269, respectively (National Bank for Agricultural and Rural Development, 2017), underprivileged communities are unable to afford a water filtration system. This is a fact that several respondents pointed out:

> An underprivileged society cannot afford the means to clean water.
>
> ...the underprivileged communities don't have access to water filters, mostly because of their inability to afford such filters.
>
> Our communities can afford filters to purify the water coming out of the ground, but the underprivileged ones don't have any means to do so.
>
> [Underprivileged p]eople are unable to afford the cost of safe and clean water, and as prices continue to fluctuate, it becomes almost impossible for them to access safe and clean water.

What has further exacerbated the problem is that the government has not been able to successfully tackle the situation, despite being fully aware of the state of the nation's water. A 2018 report published by the National Institute for Transforming India (NITI) Aayog — a policy 'Think Tank" created by the Indian government, noted that three-fourths of Indian households do not have access to safe and clean water and 70% of all water is contaminated. Even though the government has made water a major part of its second-term agenda, with its Jal Jeevan mission that aims to provide piped water to all rural households in India by 2024, the realisation of this project doesn't seem realistic (Sleet, 2019). Specifically, the budget allocated to the new ministries that have replaced the old ones, is by no means, adequate (Bhaduri, 2019; Sleet, 2019). While projections suggest that it will cost the government around INR5 trillion rupees to implement this project (Sleet, 2019), the government has allocated INR3.6 trillion (Press Trust of India, 2020).

Furthermore, the minister of the dedicated ministry for solving the water problem also does not have specific, proactive goals, with a statement of seeking to bring "sensitivity" to water issues and raising awareness ("No Additional Budget or Specific Targets for Jal Shakti Abhiyan", 2019). The minister has also claimed that there is no reason to change the groundwater guidelines in India, even though research shows that groundwater use has increased by 500% in the last five decades and is still on the rise (Sleet, 2019). Therefore, it is evident that the government's actions on this issue have so far been inadequate for redressing the reality of India's water crisis.

Apart from the government, the privileged population is also largely apathetic about India's unsafe water, which is reflected by the respondents' comments. The fact that India's poor are affected by unsafe water is accepted as part and parcel of India's society, without the expectation that the government steps up to its responsibility better. As written by a respondent, "In India, *sab chalta hai*" which refers to the idea that India is a nation in which these injustices won't be questioned since everything seems to be accepted here. Due to this widespread tacit perception, the water crisis in India is considered a "silent crisis" because of the lack of discourse on an issue that largely impacts only the country's most vulnerable who lack power and influence in Indian society (Lal, 2018).

While the privileged population's apathy towards the plight of the poor may seem shocking to outsiders, it is important to understand that discrimination is an endemic part of Indian society. India is home to one of the earliest forms of classism, the caste system, which is over 3000 years old ("What is India's Caste System?", 2019). This hierarchical system of social division divides people based on "class" — Brahmin, Kshatriya, Vaishyas and the Shudras. Despite the fact that the Indian constitution bans all discrimination based on caste, this form of social stratification continues to have a stranglehold in parts of India. One respondent pointed out this reality: "Discrimination is common in India; thus, not a lot of people bat an eye when something of this magnitude is occurring." However, more than just a cultural tradition, the caste system has debilitating real-life repercussions. As R.M. Pal (n.d.), a renowned writer of human rights issues, stated so eloquently, India's "caste system is a major source, indeed an obnoxious one,

of human rights violations" (para.1). It has led to the normalisation of the apathy of the Indian government and its privileged citizens towards the country hasn't been able to cater to a basic human right for all, regardless of their socioeconomic status.

Worse still, this mentality has intensified ever since India opted to follow in the footsteps of Western nations by pursuing capitalistic transformation policies during the 1990s, thus further increasing socioeconomic inequity. According to Oxfam International (n.d.), "It would take 941 years for a minimum wage worker in rural India to earn what the top paid executive at a leading Indian garment company earns in a year." As one respondent explained it,

> Wealthier people in large modern cities tend to have better access to such resources because that's where "the money is"... at a lower socioeconomic rank, you miss out on such facilities and both access and availability reduce.

Thus, India's underprivileged keep getting the worse end of the lot in life, including the safety of the water they receive.

Conclusion

The aim of this research study was to examine the perceptions of the privileged respondents of Gurgaon towards their ratings of the safety of the water in their communities vis-a-vis India in general and underprivileged communities. The aim of this research study was to conduct an in-depth and focused analysis of socio-economic inequity in India through privileged Gurgaon residents' rating of the safety of the water in their community, India in general, and underprivileged communities. Both quantitative and qualitative data were gathered and analysed to evaluate the Indian respondents' ratings of the quality of water in three different communities: their own community, the underprivileged community, and India in general.

Based on the results, the null hypothesis that there are no differences between the mean ratings of the quality of the water between the qualities of the water is rejected. Specifically, this study found that the respondents perceived the water in their communities to be of the highest quality, followed by that of India in general, and the water for the underprivileged communities. As such, it reveals the respondents' strong awareness of the existence of significant disparities regarding access to safe water in underprivileged communities, which they seemed to consider to be an immutable part of life in the nation.

An in-depth analysis of the qualitative data underlying the respondents' ratings of the safety of the water gives further insights into the landscape. Essentially, the government's failure to ensure that all its citizens paying for water are able to get clean, drinkable water from their taps or the common source in their neighbourhood so far has been accepted as a given (Sleet, 2019). As a result, those who possess the means submit to the fact that access to safe water in the country can be obtained only through the purchases of water purification systems (Magnus, 2020). In the process, they appear to be indifferent to the reality that the vast majority of their counterparts do not have access to safe water. Delving deeper into the underlying cause, one can see that the lack of accountability of the government and the overall apathy of the privileged communities stem from India's entrenched inequalities of its culture with its caste system that has normalized the discrimination of the underprivileged. This entrenchment has been further intensified by India's national economic strategy of the 1990s to advance a capitalist agenda.

The stance of the respondents, as illuminated in this research paper, is best summed up by a respondent:

> Our social-economic status determines a vast number of things in our life, and so socio -economic inequities similarly influence our accessibility to safe and clean water; wealthier people in large modern cities tend to

have better access to such resources because that's where "the money is". At a lower socioeconomic rank, you miss out on such facilities and both access and availability reduce; people are unable to afford the cost of safe and clean water, and as prices continue to fluctuate, it becomes almost impossible for them to access safe and clean water. Discrimination is common in India; thus, not a lot of people bat an eye when something of this magnitude is occurring.

Clearly, India should be rethinking about the way it is approaching the water crisis. Some recommendations for approaching this problem are as follows:

1. Advocacy: Based on their awareness of the disparities in access to safe water, all residents in Gurgaon (and India) should unite in demand initiatives from the government at all levels to tackle the water crisis effectively.
2. Filters: Given that the restructuring of India's water infrastructure would take a substantial investment of time and resources, a more immediate solution that would prevent illnesses would be to develop and produce a cheaper and more efficient water filter, which would help solve the water safety crisis for many. These filters should be provided free, be subsidized, or available at such a low price that everyone can afford it. Advances in technology would also be making a difference in addressing this issue. For example, a low-cost solar water purifier (SWP) for rural households has been developed. With a predicted cost of only INR1500 when manufactured at a large scale (Rajvanshi & Rajvanshi, 2019), filters like these can help make a huge difference in preventing diseases related to polluted water.
3. Eventual change of piping: In the long term, the dirty and leaky pipes transporting water in India, which are polluting water going through them, would need to be changed. By adopting this long-term project, in tandem with the filter solution described above, India can move decisively towards access to safe water for all.

However, for any of the above to occur, Indians would have to change their mindset regarding inequality and society, and challenge it, instead of accepting it as a part of life. Working with the government to solve this escalating issue is of the utmost importance.

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