

Perceptions and attitudes towards the quality of drinking water in two communities in Region 6, Guyana

Andre Indardat ¹, Phillip N. B. Da Silva ^{1,2} and Lakhnarayan Kumar Bhagarathi ^{1,2,*}

¹ Division of Natural Sciences, University of Guyana, Berbice Campus, Tain, Corentyne, Berbice, Guyana.

² Institute for Marine and Riverine Ecologies and Economies, University of Guyana, Berbice Campus, John's Science Centre, Corentyne, Berbice, Guyana.

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Abstract

In Guyana, potable water is supplied by a single national utility company, but increasing consumer concerns about its quality have led to a growing reliance on bottled water, provided by private processors, for drinking. This study examined consumers' perceptions and attitudes toward potable tap water supplied by the national water utility provider, compared with bottled water supplied by private water processors in two communities, one urban and one rural, along East-Berbice Corentyne, Region 6, Guyana. One hundred respondents were surveyed, using a structured questionnaire consisting of demographic items and perception-based questions measured on a five-point Likert scale. Data were analyzed using Statistical Package for Social Sciences (Version 23) and presented in graphs, tables, and descriptive statistics. Findings revealed a preference for bottled water as the primary source of drinking water, particularly in the urban community. Most respondents perceived the potable water supplied by the national utility company as poor in quality, citing concerns about contamination, taste, discoloration, and sediments. In contrast, bottled water was generally perceived as better in quality, although respondents expressed doubts about the adequacy of quality testing conducted by private processors. Overall, participants agreed on the need for improved water quality monitoring, stricter licensing of private water processors, and greater accountability from the national provider. These findings underscore the importance consumer perceptions and their role in influencing water policy and management.

Keywords: Potable water; Bottled water; Consumer perception; Water quality; Guyana

1. Introduction

Water is essential to all living organisms, most ecological systems, human health, food production and economic development, and without it, humans and some other life forms cannot survive for long periods [4, 21].

Although access to clean water is a basic human right and an essential aspect for improving living standards globally [24], the quality of drinking water has always been a major issue [3]. The safety and quality of drinking water is an ongoing concern, but coliform-free potable water may not necessarily be free of other pathogens [9]. Understanding consumer perception of potable water is not only important, but it can contribute to improvements in water management and eventually consumer satisfaction [9].

Globally, there has been an increase in the use of bottled water and there appears to be many reasons for this decision, among which are the health aspect, purity and taste [9, 13], availability and convenience [9, 13] and perceived purity [2, 17]. Dissatisfaction with tap water and a preference for bottled water is somewhat rooted in the fact that consumers

* Corresponding author: Lakhnarayan Kumar Bhagarathi

have tended to be dissatisfied with the organoleptic characteristics of tap water and a perception that bottled water is better in these characteristics [1, 8, 11, 18].

In Guyana, there is one national utility company that is responsible for providing potable water to households. Over the years, there has been an increase in the number of private companies that process and bottle water for commercial sale. This increase in private water processing companies has mirrored an increase in the use and demand for bottled water as an alternative to tap water. In the midst of much concern by consumers about the quality of water supplied by the main public utility with the responsibility for supplying potable water to Guyanese citizens, there is now an apparent preference for bottled water especially for drinking purposes.

However, while this is the case, there has not been many reported studies that have addressed the issue of consumer perception of the water quality supplied by the public utility and that of bottled water supplied by local water processors in Region 6, East-Berbice, Corentyne, Guyana. Perceptions of the quality of drinking water can be useful when developing policy and service enhancements regarding potable and drinking water quality [9].

The general aim of this study is to assess consumers' perceptions, attitudes towards the quality of water supplied by the national utility company with the responsibility for supplying potable water and private water processors, to two communities on the Corentyne coast in the Region 6 area. The objectives of this research are: (i) To determine consumers' perception of the potable water supplied by the national utility company with the mandate to supply potable water in Region 6. (ii) To determine consumers' perception of the quality of bottled water supplied by local water processors in Region 6. (iii) To determine which two source of drinking water consumers in the two communities in Region 6 prefer.

2. Methodology

2.1. Convenience Sample

One hundred (100) participants from two communities in Region 6, were identified to participate in this survey. Their selection was based on their availability at the time when the study was being conducted.

2.2. Study Location and Delimitation

This study was conducted in Region 6, East-Berbice Corentyne and participants were identified from two communities; one rural and one urban. As such, the results from this study cannot be taken as fully reflective of the situation in the entire country, nor can it fully represent the entire Region 6.

2.3. Procedure of Data Collection

A trial survey was conducted with persons from one community in, Region 6, East-Berbice Corentyne that was not included in the final survey, to determine respondents' understanding of the questions and to identify any change that would be required, before the final questionnaires were distributed.

2.4. Instrumentation and Implementation

One hundred questionnaires were distributed between the two communities (Community A, an urban community and Community B, a rural community) in Region 6 that were identified for the execution of the study. Fifty questionnaires were randomly distributed in each of the two communities.

Each questionnaire had four sections and a total of fifteen questions, which addressed demographics, consumers' perception and attitude toward the quality of potable water supplied to their communities and their perception and attitude of the quality of bottled water supplied by private water processors. A 5-point Likert scale was used to represent respondents' attitudes and perceptions.

2.5. Data Analysis

The data that was collected were analyzed using the Statistical Package for Social Sciences (SPSS) version 23 and the results were presented in graphs and tables.

3. Results and Discussion

3.1. Demographics

The results showed that there were 55% females and 45% males in the sample of participants. These respondents were selected from the two study communities, based on their availability at the time when the study was being conducted. Figure 1 shows the length of time that respondents resided in their respective communities. The majority of respondents (69%) resided in their respective community for more than ten years and only one respondent reported that they lived in their community for less than a year. This question was relevant because it was felt that the longer one resided in a community, the better would be their basis for comparing the water quality over the year, to determine if there was any improvement in the quality of water supplied.

Sajjadi, *et al.* (2016) [22] reported that people who lived longer in a location would have been able to compare changes in the quality of water supplied to their communities over the years. Further, Doria (2010) [9] noted that younger consumers were more inclined to choose an alternative source of drinking water rather than use tap water because they tend to be more dissatisfied with tap water because of their perception that the quality of tap water is poor.

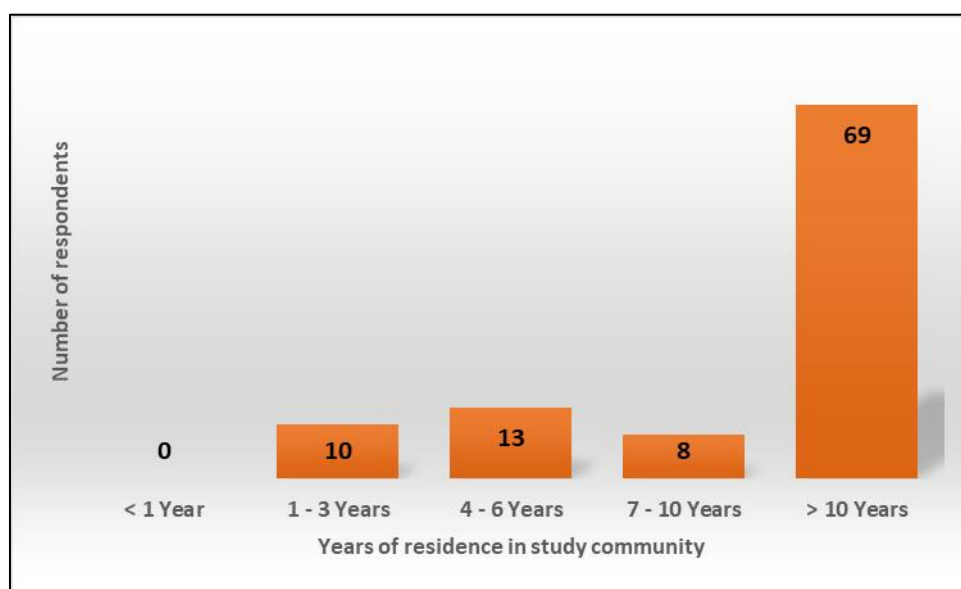


Figure 1 Length of time respondents resided in their respective communities

3.2. Source of drinking water

In both communities the majority of respondents used bottled water as their source of drinking water (Figure 2). However, there was apparent greater use of bottled water in the urban community and more rain water use in the rural community. There was very little difference in the reliance on the national public potable water supply for drinking purposes. Respondents who indicated that they used rain water, also said that they sometimes boiled the water before drinking.

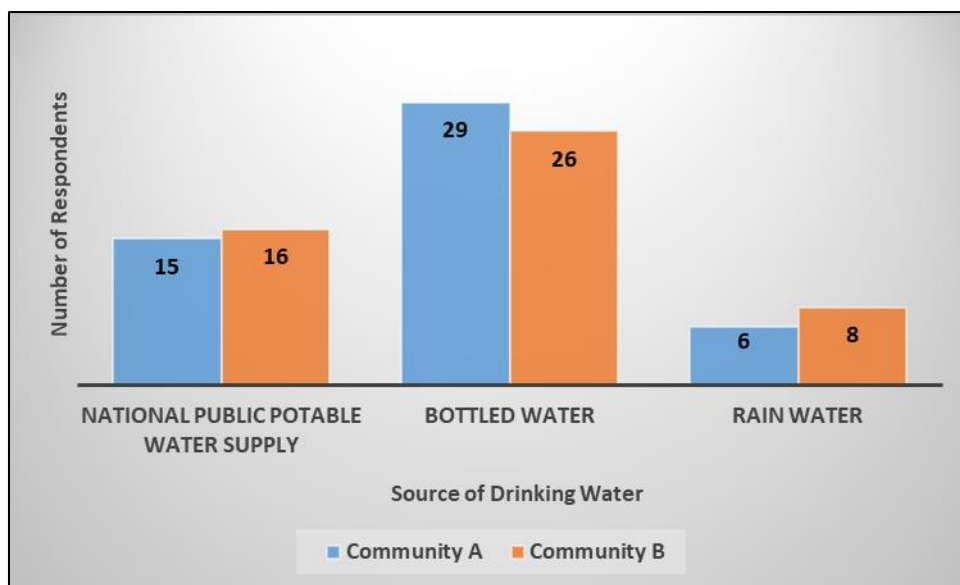


Figure 2 Respondents' sources of drinking water

3.3. Importance and perception of the quality of potable water

Figure 3 shows how respondents felt about the importance of having water of good have a good water. What is obvious is the fact that the majority of respondents from both communities were of the opinion that water quality was extremely important. A good take away from this is that there seems to be some awareness among respondents about the importance of good water quality, since none of the respondents said that water quality was either slightly important or not important.

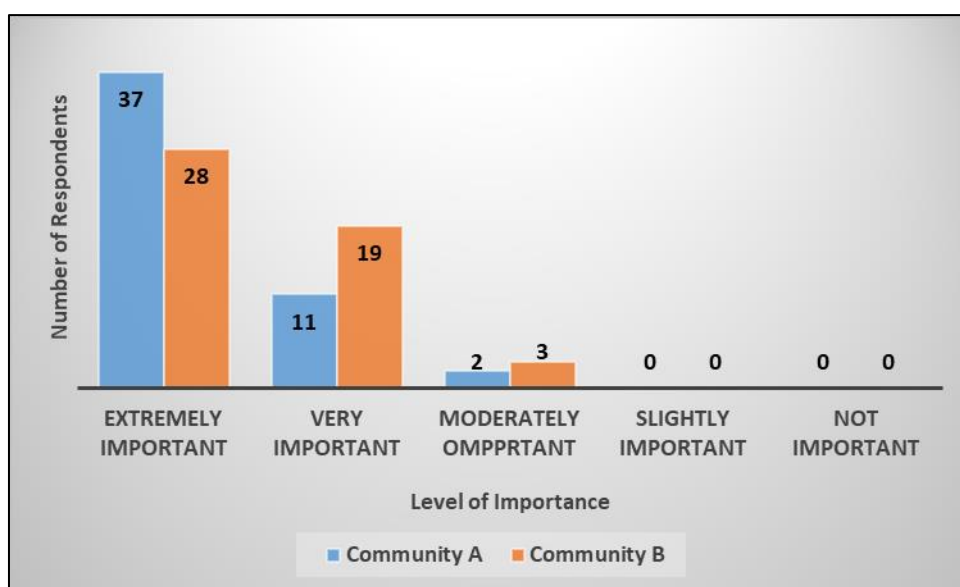


Figure 3 Perceptions of respondents about the importance of potable water quality

While the majority of respondents in both communities had a perception that the quality of potable water supplied by the national utility company was poor (Figure 4), the results also show that only 6% from Community A and 8% from Community B felt that the potable water quality was excellent (Figure 4).

With such results, if one is to attempt an explanation, one may note that there are many interacting factors which could influence the consumers' perception of the quality of the potable water that they receive [5]. Further, Sajjadi *et al.*, (2016) [22] acknowledged that it is necessary to have an understanding of consumers' perception of drinking water because such an understanding has the potential to lead to an improvement in overall consumer satisfaction.

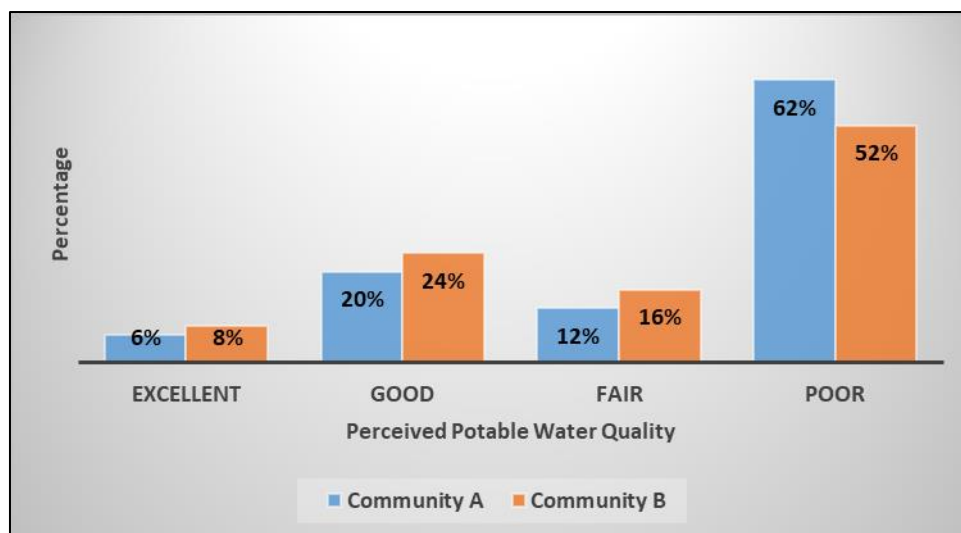


Figure 4 Perceived quality of water supplied by national entity

3.4. Expectations of water quality that is supplied to the communities

Respondents were asked what were their expectations regarding the characteristics that they consider when deciding whether the quality of water they received was of a certain quality and these expectations given by respondents are shown in Figure 5.

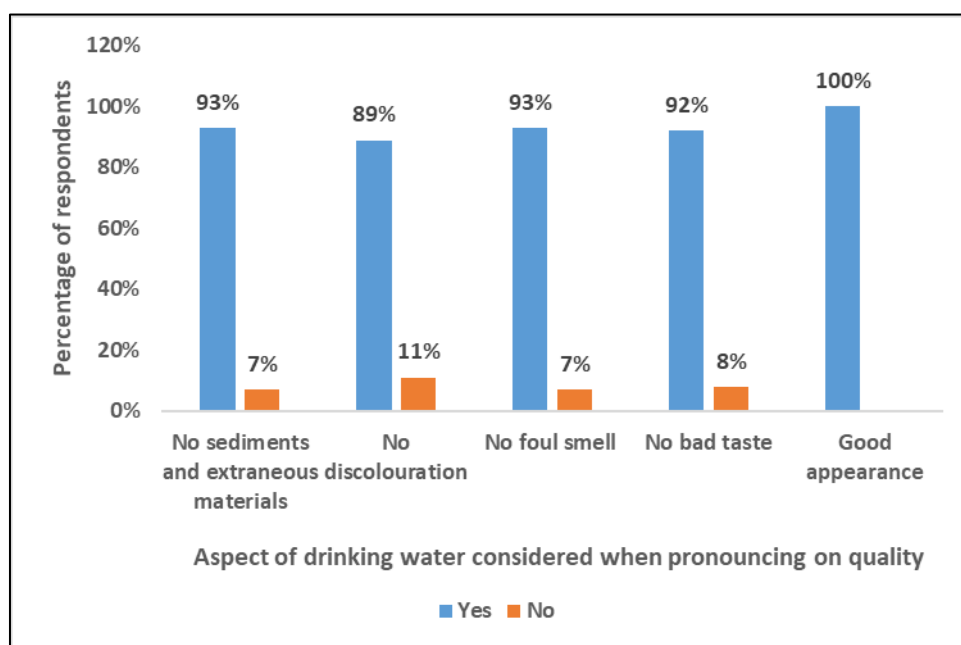


Figure 5 Respondents' expectations of water that is supplied by water suppliers

While respondents agreed that a combination of the identified characteristics was important and not based solely on one isolated characteristic, all respondents agreed that visual appearance was very important. This should not be surprising because all of the other characteristics (presence of sediments and extraneous materials, and discoloration) that could contribute to visual appearance, also had a high percentage of respondents agreeing with the importance of that characteristic.

When these expectations are examined, they appear to be similar to what was reported by Ochoo, *et al.* (2017) [19], where their study showed that people were generally dissatisfied with water quality that was affected by bad taste, foul smells, was discolored and had sediments and extraneous materials. Further, because these results demonstrate a somewhat varied mix of expectations, one may see some concurrence with Dianty *et al.* (2022) [6] who reported that

assessing perceptions of water quality can be complicated because different individuals have different perceptions of the quality of drinking water.

Dianty *et al.* (2022) [6] also noted that consumers sometimes make determinations about drinking water quality based on visual appearance, but fail to consider possible microbiological contaminants. Maybe limited awareness of the full suite of water quality parameters may be responsible.

Emerging from the results for this study in relation to consumers' expectations of water of good quality as shown in Figure 5, is the fact that there is a need for consumers to be made more aware of the importance of multiple characteristics that contribute to overall drinking water quality and this must include attention to physicochemical characteristics when making a pronouncement on the quality of drinking water. Such expectations may have been based on experience and trust which could be grounded in knowledge and awareness of water quality parameters. Consumers' experience with tap water quality and the risks that they may have taken, play a role in consumers' decision to use tap water for drinking purposes [9, 14, 23].

However, while there have been increased efforts globally to deliver drinking water of good quality that meets the expectations of consumers and as a result have the trust of consumers in terms of using the water that is supplied, there are still gaps in terms of how well the factors that influence consumers' perceptions are understood [9].

Further, as a result of the complex nature of the factors that influence consumer perceptions, Ochoo, *et al.* (2017) [19] questioned how reliable was public perception of quality of drinking water and accompanying health risks. As such, one could still ask if public perception of drinking water quality equates with actual water quality [19].

3.5. A growing preference for bottled drinking water

Most of the respondents in both communities used bottled water as their source of drinking water, maybe because respondents from both communities reported that the quality of potable water they receive in their communities is poor. With this being the situation, consumers may have had a difficulty using the water for drinking purposes. Doria in 2006 [8] reported that dissatisfaction with the quality of tap water could be a probable reason for the increase in the use of bottled water for drinking purposes. This may also be supported by Grondin *et al.* (1996) [11] and Abrahams *et al.* (2000) [1] who noted that the organoleptic property of water is very important when deciding on the quality of drinking water.

The results also showed that respondents were of the opinion that bottled drinking water had a better quality than the potable water they receive. This result is similar to what was reported by Hu *et al.* in 2011 [13]. Table 1 presents results of questions where respondents were asked to indicate their level of agreement or disagreement with the statement. The responses were measured on a five point Likert scale.

Table 1 Descriptive Statistics for Perceptions of Specific Aspects of Water Quality

Statement	Mean (M)	Standard Deviation (SD)
There is need for improved water quality monitoring of potable water.	4.32	0.526
Water from private water processors is of a higher quality than the potable water supplied by the national provider.	4.12	0.512
Private water processors always do the necessary water quality tests.	2.99	0.722
More stringent licensing measures should be put in place for private water processors.	4.02	0.530
Contamination of potable water is a problem.	4.21	0.531
Enough is being done by the national utility that provides potable water to ensure high quality of potable water	2.35	0.514
If the quality of potable water supplied by the national provider improves significantly, I am prepared to use it for drinking.	3.27	0.831
Grand Mean and Grand SD	3.51	0.606

Key: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Respondents in this study overwhelmingly agreed that contamination of potable water is a problem ($M = 4.21$; $SD = 0.531$) and that there is need for improved water quality monitoring of potable water ($M = 4.32$; $SD = 0.526$), water from private water processors is of a higher quality than the potable water supplied by the national provider ($M = 4.12$; $SD = 0.512$).

Overall, respondents did not agree that enough is being done by the national utility that provides potable water to ensure high quality of potable water ($M = 2.35$; $SD = 0.514$), neither did they agree that private water processors always do the necessary water quality tests ($M = 2.99$; $SD = 0.722$).

Upon closer examination of the results presented in Table 1, one may surmise that respondents have high and reasonable expectations regarding the quality of potable supplied to them. Also, they were doubtful that the private entities were conducting the necessary water quality tests on their product.

4. Conclusion

Residents of both communities that were investigated, were found to have a preference for bottled water for drinking purposes rather than potable tap water supplied by the national utility company.

Given the increase in the use and preference for bottled water, consumers need to become more aware of guidelines and regulations regarding the bottled water sector [10]. Greater monitoring and licensing of private water suppliers of bottled water is therefore necessary, amid increasing public concern about the quality of their drinking water [2].

The increase in use of bottled water can have environmental problems due to the improper disposal of used water bottles. These disposed empty plastic bottles are fast becoming a major waste management issue in communities, where clogged drains are among the most visible environmental impact of such poor disposal practices. This can eventually add to the growing microplastic contamination and pollution issue that is emerging as a major environmental issue.

Consumer dissatisfaction with the quality of potable water could be used as a starting point to increase community engagement and so better understand the issues regarding the quality of potable water supplied to communities in an effort to address the concerns of communities. Delpha *et al.*, (2020) [5] reported an associated between consumers' satisfaction with potable tap water, their knowledge about the quality of drinking water, the water production process and risk perception. Therefore, to improve consumers' satisfaction with potable tap water, more information provided to consumers that address these concerns will become necessary.

In the final analysis, according to Pierce & Gonzalez (2016) [20], whether consumers are satisfied with the potable water they receive from a national public provider, and if they trust the source of the water, this could determine their perception of the quality of the water and ultimately determine if they will use it for drinking purposes or seek out alternatives such as bottled water provided by private water processors.

Recommendations

The following recommendations are made, based on the study conducted:

- Since this was a preliminary exploratory study, more communities in Region 6 should be surveyed to get a holistic picture about perceptions of residents in Region 6 about the quality of potable water supplied to their communities.
- Microbiological testing should be done regularly on the drinking water that private water providers offer for sale and the results should be available to the public if requested.
- Licensing of private water processors should be closely monitored to ensure that only those who are compliant are licensed and can be relicensed.
- There should be regular and continuous monitoring of the water quality of both public potable water supply and private water processors.

Compliance with ethical standards

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Disclosure of conflict of interest

The authors certify that this submission is original work and is not under review at any other publication. The authors hereby declare that this manuscript does not have any conflict of interest.

Statement of informed consent

The authors declare that informed consent was obtained from all individual participants included in the study. All work utilized in this study was fully cited and referenced so authors of prior researches are given their due credentials for their work.

Data Availability

Data will be made available on request.

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