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Evaluating Water Consumption and the Potential for Conservation Strategies in Household Settings: A Study at Phase 1 Barangay Bf Homes Parañaque City

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ABSTRACT

This study evaluated water consumption and the potential for conservation strategies in household settings in Phase 1, Barangay BF Homes, Parañaque City. This study aimed to evaluate water consumption patterns in households in Phase 1, Barangay BF Homes, Parañaque City, taking into account previous issues with water service and urbanization. A stratified random sample method was used to conduct a household survey, with 379 household respondents providing data. The questionnaire covered demographics, water usage, conservation awareness, and conservation hurdles. Quantitative data were analyzed using descriptive and inferential statistics, while qualitative data were thematically analyzed. Water conservation issues at Barangay BF Homes Phase 1 include inadequate infrastructure, excessive expenses, and a lack of awareness. However, the community can drastically cut down on water use with more awareness, the adoption of water-efficient devices, and rainwater collection. Future efforts can be guided by the survey's diverse demographic, which includes the majority of respondents being male, between the ages of 35 and 44, and living in larger homes. Despite excessive water use, the community's understanding of peak periods offers a chance to put in place practical solutions like water metering and educational initiatives. Promoting sustainable practices requires giving locals the confidence that they can conserve water. Long-term water sustainability can be attained by the community by concentrating on these tactics.

Keywords: *Water Conservation, Household Water Usage, Awareness, Sustainable, Mixed Methods*

INTRODUCTION

The combination of rapid urbanization and population growth in Metro Manila has put unprecedented stress on water resources, making it an urgent priority to manage and conserve water (Fellizar, 2019). This population growth increases the demand for water; therefore, it is important to evaluate the current water consumption so that effective conservation strategies can be put into place. The region's water supplies have long been fraught. In 1996, only 67% of the population was served by the Metropolitan Waterworks and Sewerage System (MWSS), resulting in a huge quantity of water loss and non-uniform service (Rivera, 2014). The roots of these current challenges date back to the legacy of service failings.

According to historical data, in 1996, Metro Manila's water service was marked by limited direct service coverage, high water loss, and heavy reliance on alternative water sources. Out of Metro Manila's 10.6 million residents, the MWSS directly served only 7 million. More than 63% of the water was lost through leaks and theft, and 7.5% of the residents depended on public standpipes. These statistics, combined with nearly 770,000 service connections, are indicators of the magnitude of water service problems at that time (Rivera, 2014; Fellizar, 2019).

Table 1.1
Metro Manila Population with access to water,1996

1996	POPULATION (MILLIONS)	COVERAGE (%)	WATER AVAILABILITY (HOURS PER DAY)
Metro Manila	**11.0**	**67%**	**Average of 16**

Source: Manila Water Company, Inc.

These same historical hurdles (Table 1.1), like limited-service coverage and high losses to water, have resulted in their current high consumption patterns; thus, justifying the examination of these patterns and the implementation of effective conservation measures at the family level in Phase 1, BF Homes. In addition, groundwater is tainted with nitrates, heavy metals, and pathogens (WHO, 2011; WHO, 2017; WHO, 2019), which increases dependence on alternative, often expensive, water reserves and aggravates issues of potable water availability and accessibility. These problems are going to be reinforced by expected population growth in the National Capital Region (NCR). It is predicted the population of NCR to increase from 11,552,100 (2010) to 13,788,000 (2040) (NSCB, 2010; PSA, 2015), as reported by the Philippine Statistics Authority (formerly National Statistical Coordination Board). Such growth will require strict water management strategies, increasing pressure on freshwater resources.

Table 1.2
Projected Population in MWSS Service Area (NSO)

PROJECTED POPULATION NCR	
YEAR	**POPULATION**
2010	11,552,100
2015	12,220,500
2020	13,216,700
2025	13,216,700
2030	13,740,300
2035	13,759,380
2037	13,759,380
2040	13,788,00

Source: NSCB Website September 2011

BF Homes Phase 1 in Parañaque City also developed its own water service. Before Maynilad came in, people depended on deep wells run by the Parañaque Waterworks and Construction Corporation (PWCC), leading to low water quality and availability. Some infrastructure projects were implemented when Maynilad Water started investing in 2009. These initiatives aim to provide more accessible water in select areas of BF Homes. Yet, (i) the extent of coverage to date, and (ii) the impact of these advances on home water use practices, remains poorly understood. Such a debate is not new (certainly this is familiar across other parts of the country) to Metro Manila and represents an ongoing challenge in balancing affordable access to water while ensuring that the water rates remain financially sustainable for water operations. Existing disputes illustrate the importance of studying household water use behavior with respect to water tariffs. MWSS does include general information on responsible water use on its website. (Metropolitan Waterworks and Sewerage System Corporate Office).

MATERIALS & METHODS

This mixed-methods research design uses both quantitative and qualitative approaches to give a comprehensive study of the water consumption data and conservation mechanisms in Barangay BF Homes Phase 1, Parañaque City. These are complemented with contextual insights into residents' behavioral and attitudinal drivers, which provide a deeper understanding of the complexities of water use and the factors that drive it. For the quantitative part, descriptive research design will be used, in which structured surveys will be administered to households. The numerical data for analysis was gathered using surveys designed to collect demographic information, current water consumption patterns, and conservation behaviors of the subjects.

The survey specifically include questions collecting information relating to household size and income levels, water consumption habits, and current conservation practices through Likert-scale and multiple-choice questions. The quantitative data were analyzed through statistical methods, such as descriptive statistics (mean, median, standard deviation) to summarize demographic and consumption data and correlation analysis to examine relationships between socioeconomic factors (e.g., income, household size) and water use behaviors. Water consumption patterns in the community was established by the data derived from the survey. The qualitative aspect is based on a phenomenological methodology aiming to describe and interpret the lived experiences of inhabitants regarding water consumption and conservation.

Semi-structured interviews and FGDs (Focus Group Discussions) were utilized to gather rich, descriptive data regarding residents' perceptions, attitudes, and challenges through their responses. The qualitative data were collected following the quantitative analysis to provide better insight into the quantitative outcomes. The thematic analysis was followed the six-phase process described by Braun and Clarke (2006): (1) familiarizing yourself with the data; (2) generating initial codes; (3) searching for themes; (4) reviewing themes; (5) defining and naming themes; and (6) producing the report. To ensure rigor, member checking were conducted, where participants were provided the opportunity to examine and confirm the interpretations. Furthermore, to increase the credibility and dependability of the findings, peer debriefing was used.

RESULTS AND DISCUSSION

This section presents the findings, analysis, and interpretation of the study that focuses on the analysis of water consumption and conservation strategies in Barangay BF Homes phase 1, Parañaque City.

A. Mixed Method Analysis

1. Qualitative Analysis (Narrative Analysis)

This section presents the narrative analysis on the challenges, opportunities, and potential of implementing water conservation interventions in Barangay BF Homes Phase 1. This research investigates the challenges and opportunities for improving water sustainability at the household level in this community.

1.1. Challenges, Opportunities, and Potential of Implementing Water Conservation Interventions:

a. Implementation of Water Conservation Interventions Challenges:

Poor Awareness and Education. One of the major issues we are facing, which is being unaware of the need for water conservation. And most households don't know about the importance of reducing water consumption, with misconceptions such as the notion that water is abundant or that their individual usage has no impact. For example, some locals may think that rainwater keeps renewing water sources to the east and west or that groundwater is unlimited. Not being aware of the benefits of such technology in reducing water at home sets back the development of this technology in most parts. One of the major issues we are facing in the local community is the lack of awareness about the importance of water conservation. Many households are unaware of the need to reduce water consumption, with misconceptions such as the belief that water is abundant or that individual usage has little to no impact. For instance, some locals might think that rainwater constantly replenishes water sources in the east and west or that groundwater supplies are limitless. This misunderstanding has hindered the adoption of water-saving technologies, as people fail to recognize their benefits for reducing household water usage. Even small actions—like fixing leaking taps or turning off the faucet while brushing teeth—can result in significant water savings, though many remain unaware of how these simple habits can make a difference.

Figure 1. The word cloud shows lack of awareness, lack of education, and what is left to do

Cultural and Behavioral Resistance. Changes to everyday ways of doing things may face opposition from residents—especially if they appear hard or require an upfront expense. Adjusting behavior can be challenging as many types of water use are habitual. Some locals, for example, may refuse to wash their clothes at home in water-saver washing machines or want to water their yards every day because they believe it raises their property value. They thwart conservation efforts and result in the overuse of water.

Some households believe washing cars with a hose gives cars a better clean than washing a car in a bucket, despite it wasting more water. A lot of them take long showers to relieve stress, unaware of how much water they are wasting.

Figure 2. Word Cloud Analysis: Cultural and Behavioral Resistance

Cost of Water-Saving Technologies. Many homeowners may be deterred, at least initially, by the cost of implementing water-saving measures. Although they end up lowering water costs over time, devices like rainwater harvesting systems, water-efficient washing machines, and low-flow faucets can be costly to install. For example, even when it may save them money in the long run, managing household finances, they may choose not to install a rainwater harvesting system if it creates high upfront costs for installation and issues for maintenance.

Households considering the installation of water-efficient washing machines may hesitate due to their higher cost compared to conventional models. Similarly, while some families acknowledge the benefits of rainwater harvesting systems, many opt not to install them because of the significant upfront expenses and ongoing maintenance requirements.

Figure 3. Word Cloud Analysis Cost of Water-Saving Technologies

Inadequate Infrastructure. A lack of infrastructure can significantly cripple water conservation measures. For instance, the success of individual conservation efforts may be limited when there are no adequate wastewater treatment systems or rainwater harvesting facilities in the community. In Barangay BF Homes Phase 1, for instance, homes lack modern plumbing, so there is no proper system to ensure efficient water distribution but also minimization of waste on the family level, meaning that even if families make an effort to conserve their water, it will go to waste with these leaks.

Water wastage is also a concern in Barangay BF Homes Phase 1 due to leaky, old pipes. These aging pipes tend to leak, causing water to be wasted before it even reaches households. Additionally, there is no community-wide rainwater collection facility, leaving residents without the necessary infrastructure to conserve water, even if they were inclined to do so.

Figure 4. Word Cloud Analysis: Inadequate Infrastructure

Policy and Incentive Scarcity. The local government must provide supporting policies and incentives for water conservation. But often, they are either lacking or inadequate. Without financial incentives, such as rebates for water-efficient appliances or stricter enforcement of regulations on water use, many residents may lack the motivation to engage in conservation measures. At the same time, fewer consumers might get the same return on their water-saving gadget investments if there no longer are water bill rebates available for those who install them.

Without government rebates, residents are less inclined to purchase water-saving devices, such as dual-flush toilets. The absence of financial incentives makes it more difficult for them to justify the initial investment in these water-efficient gadgets.

Figure 5. Word Cloud Analysis: Policy and Incentive Scarcity

Prioritization of Challenges. According to the recognition challenges, cultural resistance and acceptance of new technologies are the biggest obstacles, and the lack of awareness and education on the potential of these technologies is a common cause. Another issue is poor infrastructure; without it, even the most well-meaning households will struggle to save water. The problem is aggravated by financial barriers, including the price of equipment that promotes saving water as well as an absence of government subsidies.

Interconnectedness of Challenges. The difficulties mentioned above are related to one another. For instance, there may be cultural resistance to conservation, as communities do not understand the long-term benefits of conservation. Poor infrastructure reduces the efficiency of conservation efforts, and a lack of incentives and policies makes it harder for people to justify the expense of water-saving devices. By recognizing these relationships, policymakers may design more holistic solutions.

Local Context. In Barangay BF Homes Phase 1, socioeconomic factors play a vital role in the water conservation topic. Some households may want to participate in conservation measures while struggling with affordability, and some may be affluent but clueless about investing in water-saving devices. Cultural preferences for routine car washing and having verdant landscaping also lead to higher water usage. These regional problems require an individualized approach, complete with infrastructure upgrades, incentives, and education.

b. Potentials For Water Conservation Strategies:

Educational Campaigns and Community Engagement. One of the most significant potentials for water conservation in Barangay BF Homes Phase 1 is increasing awareness through community involvement and education. Locals can gain knowledge about the need to conserve water and practical strategies to reduce usage through: (a) Local workshops that feature water-saving device demonstrations, (b) Educational programs including online tutorials and leaflet distribution; and (c) Curriculum-based initiatives in schools that incorporate water conservation.

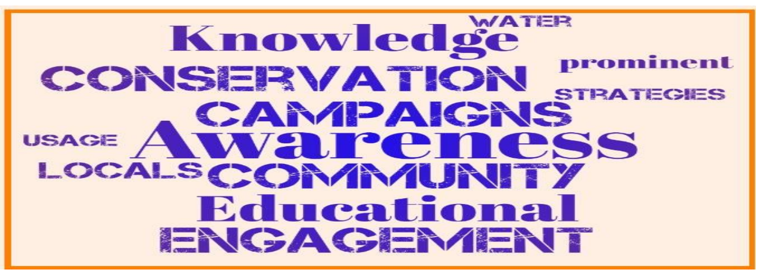


Figure 6. Word Cloud Analysis: Educational Campaigns and Community Engagement

Promotion of Water-Efficient Technologies. There are numerous opportunities for the community to adopt water-efficient practices. It is possible to promote the use of water saving appliances like dual-flush toilets, low-flow faucets, and water-efficient dishwashers or washing machines by: (a) Rebates or incentives offered by the government for the installation of water efficient equipment; (b) Public education campaigns about the cost of lower water bills; and (c) Partnerships with appliance retailers to offer product rebates on water-saving models.

Figure 7. Word Cloud Analysis: Promotion of Water-Efficient Technologies

Rainwater Harvesting Systems. The regular rainfall means that rainwater collecting can greatly reduce the demand on the local water supply. Installation fees, for example, are issues that need to be worked out. Some implementation strategies may include: (a) Installation incentives from the federal government to cover costs; (b) Installation subsidies from the government to defray expenses; (c) Public awareness campaigns promoting the benefits for non-potable uses such as cleaning and gardening; and (d) Advocating for shared rainwater collection infrastructure to be built.

Figure 8. Word Cloud Analysis: Rainwater Harvesting Systems

Water Metering and Monitoring. By installing water meters and real-time monitoring systems, the neighborhood could provide homeowners with valuable insights into their water usage behaviors. The strategy can be implemented via the following: and real-time monitoring systems. This strategy can be put into practice through: (a) Immediate reporting from smart water meters; (b) Apps for smartphones that warn locals about excessive water use; and (c) A target to cut water use in households by 10% in the first year.

Figure 9. Word Cloud Analysis: Water Metering and Monitoring

Partnerships with Local Government and NGOs. Conservation initiatives can be strengthened by partnerships with NGOs and government organizations. Types of potential collaborations include Working with the DENR on educational initiatives and working with NGOs such as the Philippine Water Partnership on resources and funding. Engaging private sectors in CSR for water conservation processes.

Figure 10. Word Cloud Analysis: Associations to Local Authority and NGOs

Comprehensive subsidy and financial incentives reform: A potential incentive to incorporate water-saving systems into households is (a) Tax breaks for the purchase of water conservation appliances, (b) Conservation targets for households that receive water bill discounts, and (c) Grants for low-income families for the installation of rainwater harvesting systems.

Figure 11. Word Cloud Analysis: Financial Incentives and Subsidies

Community Support and Collaboration. By encouraging a culture of shared responsibility, conservation efforts can be strengthened through: (a) Tax breaks for the purchase of water conservation appliances; (b) Conservation targets for households that receive water bill discounts; and (c) Grants for low-income families for the installation of rainwater harvesting systems.

Figure 12. Word Cloud Analysis: Community Support and Collaboration

Prioritization And Feasibility. But there would be practical measures that would be best to eradicate first and get to empowering real & lazy water conservation. Water meters and educational initiatives may yield the most noticeable effects up front because they impact behavior directly and allow for real-time feedback on consumption. They may take longer since incentives and infrastructure upgrades are needed, but they can make a significant long-term difference.

c. Addressing Potential Challenges:

Installation Costs. The high up-front cost of water-saving technology can be subsidized with the provision of government or non-profit-funded installations.

Long-term Use. Basic maintenance skills can be taught to the inhabitants in order to promote long-term use. Behavioral Resistance: A shift in public perception and participation can be easier if incentives and education are combined.

Integration with Existing Infrastructure. To be impactful, new conservation methods need to feed into the existing water distribution and supply wells. Infrastructure upgrades should focus on making water distribution more efficient, halting leaks, and installing smart monitoring systems.

Integration of Strategies: Each tactic should reinforce the others. Incentives, for example, can encourage participation in rainwater harvesting programs; educational outreach can increase the uptake of water saving technologies.

1.2. Overview of Water Conservation Approaches and Initiatives:

This narrative analysis provides an overview of several approaches, initiatives, and programs designed to promote water conservation at home in a community. It focuses on both personal and collective efforts to ensure a reliable, cost-effective, and clean water supply while minimizing overall consumption. The proposed strategies promote sustainable water management in the community through economic and environmental soundness.

a. Prioritization And Feasibility

While the studies draw on a diverse array of strategies, it is important to prioritize those with the biggest potential and effect. Given their direct effect on public engagement and access to water, rainwater harvesting schemes and initiatives for community-wide awareness are likely to have the most visible impacts in the immediate future. More sophisticated technologies, such as self-sustaining water treatment systems, offer long-term benefits but also require more infrastructure and funding.

b. Self-Sustaining Water Treatment Systems

Establishing a water treatment facility organized in the same location as a neighborhood can minimize dependence on outside sources and allow the scale of the facility to be determined by community need and funding. There are filtration systems or UV purification that can help make drinking water safe.

Figure 13. Word Cloud Analysis: Measuring a Self-Sustaining Water Purification System

Water Availability and Supply. Rainwater collection can be more effective with large capacity storage tanks, gravity-fed systems, and filtering methods such as sand filters and activated carbon. Promoting collection systems for rainwater on roofs can maximize the use of rainwater for non-potable uses in homes.

Figure 14. Word Cloud Analysis: Water Availability and Supply

c. Water Recycling and Reuse

Water analysis data, represented in interactive boards placed in convenient places, can reveal seasonal shifts, zones of high concentration, shifts in consumption behavior and other data that can be seen in real time. They might hold workshops to teach locals what their good habits with the water are and how to save.

d. Efficient Water Use Practices

Focus is on simple but effective actions, like turning the faucet off when a pipe isn't running and promptly repairing leaks. In addition to ensuring its community members are doing what they can to save water, the neighborhood also conducts regular checks on all plumbing and water fixtures in homes to ensure leaks are caught in time and to avoid waste. This includes monitoring the water pressure to maintain the right flow and prevent excessive use.

Figure 15. Word Cloud Analysis: Water-Efficient Practices

e. Increase Community Knowledge and Education

Community education is a key element of our conservation plan. Regular water conservation seminars, information drives, and awareness initiatives serve as the backbone towards the push for responsible water usage. Showing water test data reinforces sustainable clean water supplies rather than unintentional environmental harms due to overconsumption.

Figure 16. Word Cloud Analysis: Raising Awareness and Education of the Society

f. Rainwater Harvesting Systems

Optimizing water conservation by rainwater harvesting systems for residential and commercial buildings by installing rainwater collection systems in households, communities can become self-sufficient and reduce the need for treated water from the environment.

Figure 17. Word Cloud Analysis: A Detailed Study on Rainwater Harvesting Systems

g. Maintenance of Infrastructure

Water supply timings were established by the community to ensure the availability of water. It allows for a state, regional and even national utilization of water resources, avoids useless use and is an efficient way to treat water. The operation and efficiency of a distribution system also require regular inspection and repairs of leaking water pipes.

Figure 18. Word Cloud Analysis: Scheduled Water Supply and Infrastructure Maintenance

h. Environmental and Economic Advantages:

Not only do our community's water conservation efforts have environmental benefits, but financial as well. It is essential to reduce waste and protect natural resources. In addition, lower water consumption means decreased water bills in homes, which is a practical and sustainable financial benefit. Water further decreases expenses and overall consumption.

Figure 19. Word Cloud Analysis: Environmental and Economic Benefits

i. Promotion of Tree Planting

Increasing tree planting is emphasized as part of our water conservation initiatives. Trees are essential for maintaining the water cycle and improving local climates, both of which contribute to water conservation goals. To achieve the goal of the wider field of environmental sustainability, it focuses on green spaces.

Figure 20. Word Cloud Analysis: Promotion of Tree Planting

2. Quantitative Analysis (Survey Data)

2.1 Quantifiable Goals for Water Consumption Patterns

Reduce household water use by 10% at the end of the first year of programs. Within three years, provide incentive programs to increase the adoption of rainwater harvesting by 30%. Using best reuse practices to boost recycling rates 20 percent over five years

Table 2.1
Demographic Profile of the Respondents

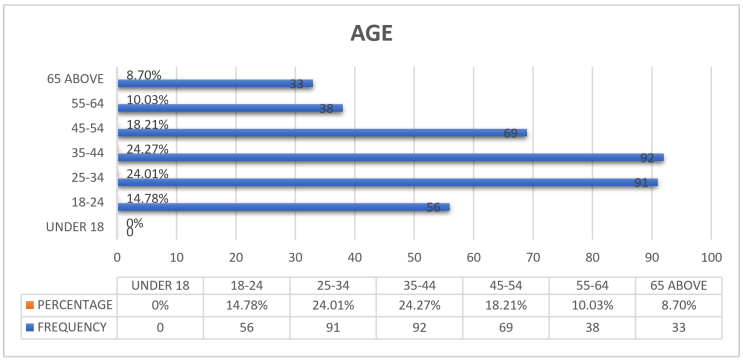
Age	Frequency	Percentage
18-24	56	14.78%
25-34	91	24.01%
35-44	92	24.27%
45-54	69	18.21%
55-64	38	10.03%
65 and above	33	8.70%
Total	**379**	**100%**
Gender	**Frequency**	**Percentage**
Male	156	41.16%
Female	223	58.84%
Total	**379**	**100%**
Number of Household Members	**Frequency**	**Percentage**
1	9	2.37%
2	37	9.76%
3	61	16.09%
4	74	19.53%
5	88	23.22%
6	30	7.92%
7 and above	80	21.11%
Total	**379**	**100%**
Monthly Household Income (Salary Range)	**Frequency**	**Percentage**
₱30,000 - ₱39,999	2	0.53%
₱40,000 - ₱49,999	29	7.65%
₱50,000 - ₱99,999	240	63.32%
₱100,000 and above	108	28.50%
Total	**379**	**100%**

Type of Residence	Frequency	Percentage
Single-detached house (small/medium-sized)	227	59.89%
Single-detached house (large-sized)	152	40.11%
Total	**379**	**100%**

Residence	Frequency	Percentage
Less than 1 year	30	7.91%
1-3 years	74	19.53%
4-6 years	54	14.25%
7-10 years	30	7.91%
More than 10 years	191	50.40%
Total	**379**	**100%**

The survey results reveal a diverse age distribution among respondents, ranging from under 18 to 65 and older. Specifically, the age breakdown is as follows: under 18 (0.00%), 18-24 (14.78%), 25 34 (24.01%), 34-44 (24.27%). 45-54 (18.21%), 55-64 (10.03%), and 65 and above (8.70%). Notably, the 35-44 age group represents the largest segments of respondents, while those under 18 were not represented.

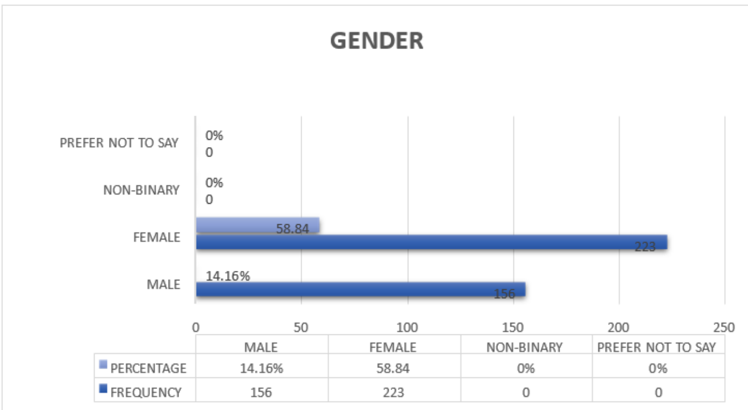
Graph 1: Age Demographics of Survey Respondents



	UNDER 18	18-24	25-34	35-44	45-54	55-64	65 ABOVE
PERCENTAGE	0%	14.78%	24.01%	24.27%	18.21%	10.03%	8.70%
FREQUENCY	0	56	91	92	69	38	33

In terms of gender, the survey shows a higher participation rate from females, with 58.84% (223 respondents) identifying as female, compared to 41.16% (156 respondents) identifying as male.

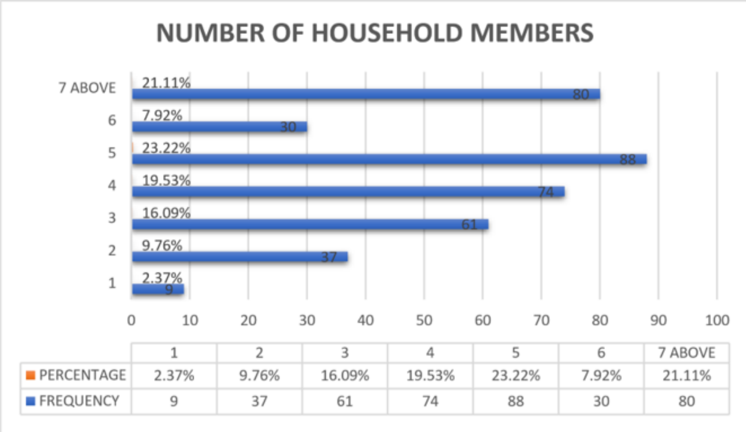
Graph 2: Gender Breakdown of Survey Participants



	MALE	FEMALE	NON-BINARY	PREFER NOT TO SAY
PERCENTAGE	14.16%	58.84	0%	0%
FREQUENCY	156	223	0	0

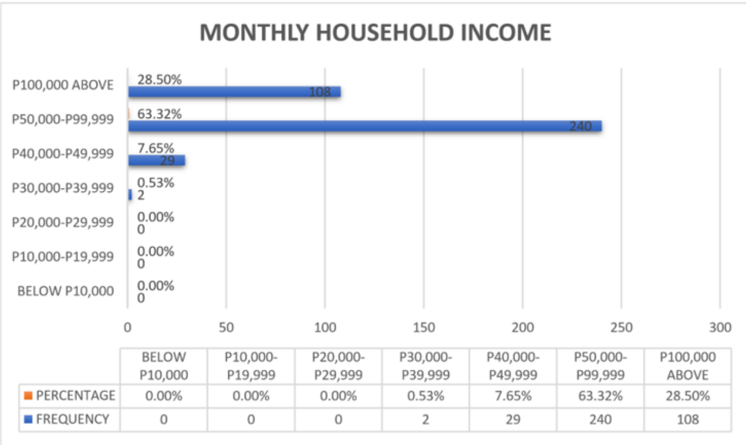
Analyzing household size, the data indicates that a significant portion of respondents live in larger households. The most common household size is five members, accounting for 23.22% of respondents. Following closely are households with seven or more members (21.11%), four members (19.53%), three members (16.09%), and two members (9.76%). Smaller households with six members represent 7.92%, while single-person households account for only 2.37%.

Graph 3: Household Size Among Survey Respondents



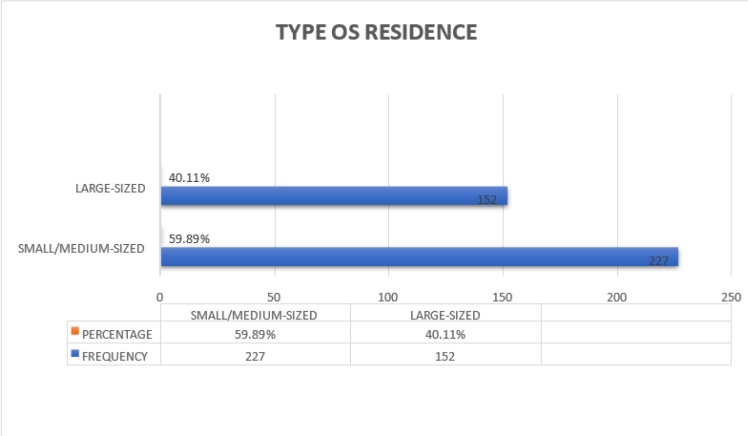
Regarding monthly household income, a substantial majority of respondents (63.32%, or 240 respondents) reported earning between ₱50,000 and ₱99,999. The second-largest group (28.50%, or 108 respondents) earns ₱100,000 and above. Additionally, 7.65% (29 respondents) earn between ₱40,000 and ₱49,999, and 0.53% (2 respondents) earn between ₱30,000 and ₱39,999.

Graph 4: Monthly Household Income Ranges of Respondents



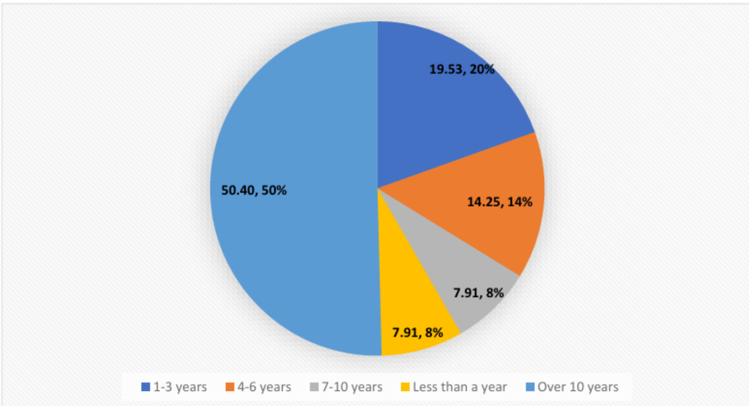
In summary, most of the respondents are female adults aged 25 to 54, living in a single-detached house. They usually reside in families of 5 or more, with monthly incomes of ₱50,000 to ₱99,999. The majority have lived at their current home for more than a decade.

The type of residence also varies among respondents. A majority (59.89%, or 227 respondents) live in small to medium-sized single-detached houses, while 40.11% (152 respondents) live in large single-detached houses.



Graph 5: Types of Residences Among Survey Participants

Finally, the survey examined the length of residence. A significant portion of respondents (50.40%, or 191 respondents) have lived in their current residence for over 10 years. The next largest group (19.53%, or 74 respondents) has lived there for 1-3 years, followed by 4-6 years (14.25%, or 54 respondents). Respondents who have lived in their residence for less than a year and 7-10 years each represent 7.91% (30 respondents).



Graph 6: Duration of Residency Among Survey Respondents

Table 2.2: Monthly Water Consumption Practices

ITEMS	WEIGHTED MEAN	DESCRIPTIVE RATING	VERBAL INTERPRETATION
1. My household actively practices water conservation and takes steps to reduce water usage.	4.35	Strongly Agree	Very High Level
2. We consistently use water-efficient appliances and fixtures to minimize our water consumption.	4.28	Strongly Agree	Very High Level
3. My household regularly monitors and tracks our water usage to ensure we are using it responsibly.	4.30	Strongly Agree	Very High Level
4. We are mindful of our water usage during daily activities such as showers, washing dishes, and laundry.	4.20	Strongly Agree	Very High Level
5. My household feels confident that our water consumption is within an efficient and sustainable range.	4.23	Strongly Agree	Very High Level
Section Mean	**4.27**	**Strongly Agree**	**Very High Level**

2.2 Analysis of Monthly Water Consumption Patterns

Table 2.2 shows the survey results on monthly water consumption practices per household. Specifically, Item 1, "My household actively practices water conservation and takes steps to reduce water usage," achieved the highest mean score of 4.35, signifying a "Very High Level" of agreement and a "Strongly Agree" response. On the other hand, Item 4, "We take care for how much water we use in daily operations, e.g., showering, washing dishes, and laundry," had the lowest mean score of 4.20, though it was still in the "Strongly Agree" and "Very High Level" category. The overall section mean for the monthly water consumption pattern is 4.27, indicating "Strongly Agree" and "Very High Level." Indicating a significant general familiarity and responsibility for preserving water within the people.

However, the lower score for Item 4 shows a possible disconnect between general conservation awareness and regular engagement in daily practices. It implies that although users recognize the necessity of conserving water, it can be difficult to act on this knowledge while showering, doing the dishes, or washing the laundry—tasks that have become virtually automatic in routine. This difference has been suggested to be due to custom and convenience taking precedence over conservation, at least sometimes. The overall section means, along with extremely high scores across all the items, indicates that there is a positive base to build upon in instituting additional water-saving behaviors. To the point that much aligned with conservation behaviors, there right here suggests future strategies such as proposed policies or education campaigns will be welcomed and effective for sustainable water application. These findings track with residents' senses of water scarcity and further reflect that people are aware.

But the disparity in daily usage suggests that there is a need to elevate our awareness to a level of consistent practice. More in-depth examination of demographic variables may show if household size, income, or education influences these conservation practices. Item 1, with the highest mean score (4.35) with respect to "My household actively practices water conservation and takes steps to reduce water usage," shows a strong commitment to the conservation approach. This is in line with previous research. Voskamp et al. (2020) discussed that demographic, economic, cultural (including environmental awareness), and behavioral factors affect urban natural resource consumption. Domene & Saurí (2006) also showed that household size and other SOCIO-ECONOMIC and DEMOGRAPHIC factors are critical to understanding domestic water consumption.

Table 2.3
Household Current Pattern of Water Consumption (Water Use Activity as Primary)

ITEMS	WEIGHTED MEAN	DESCRIPTIVE RATING	VERBAL INTERPRETATION
1. My household is conscious of using primary water only when necessary and avoids overusing it during daily activities.	4.19	Strongly Agree	Very High Level
2. We make efforts to use primary water for outdoor activities (such as gardening or washing cars) in a controlled and sustainable manner.	4.17	Strongly Agree	Very High Level
3. My household regularly implements water saving practices, such as turning off taps when not in use or using water saving appliances.	4.21	Strongly Agree	Very High Level
4. We prioritize using primary water for essential household tasks, and avoid wasting it during household activities.	4.30	Strongly Agree	Very High Level
5. My household uses primary water resources efficiently for activities such as cooking, cleaning, and bathing.	4.37	Strongly Agree	Very High Level
Section Mean	**4.25**	**Strongly Agree**	**Very High Level**

Table 2.3. Survey results on household activity patterns that reflect primary water use: The data shows that the citizens are very conscious of their basic water consumption. Leading the mean score was Item 5: "My household uses primary water resources as efficiently in tasks like cooking, cleaning, and bathing as possible," which scored 4.37. Similarly, this signifies a "very high level" of agreement and means it is "strongly agree," implying households are really assiduous about water consumption in critical indoor activities. In contrast, Item 2, "We try to use primary water for outside activities (gardening/car washing) as much as we can," scored the lowest mean of 4.17.

Although still "very high level" and considered "strongly agree," this rate indicates that residents may care about outdoor water conservation without actually reducing outdoor water use. This may be attributed to reasons like existing habits, perceived ease, or unavailability of other water sources. The entire section means of the household water consumption patterns about average water consumption definitive water use is 4.25, which also belongs to "Very High Level" and "I Strongly Agree to." Overall, this shows a relatively good level of water-saving behaviors from those households audited. These findings indicate that resident's proficiency in saving water reduces during critical indoor activities.

As we look forward to new challenges, there is potentially room for improvement with sustainable outdoor water use practices. Advice to use rainwater harvesting for gardening or water-efficient car washing, for example, can be helpful. Environmental issues are becoming a growing concern, particularly the provision of sufficient and safe drinking water, especially for areas with an increasing population (UNICEF/WHO, 2015). Household water use is also affected by factors such as host environmental conditions, season, socio-economic factors, and demographic features. This study focuses on sociodemographic factors to study private households water demand, considering that water scarcity is becoming an increasing concern. These patterns are key to creating conservation strategies and supporting water sustainability.

Table 2.4
Current Patterns of Water Consumption for Households (Consumption Monitoring)

ITEMS	WEIGHTED MEAN	DESCRIPTIVE RATING	VERBAL INTERPRETATION
1. My household regularly tracks our water usage through monthly bills or water meters to monitor our consumption.	4.25	Strongly Agree	Very High Level
2. We make a conscious effort to compare our water usage each month to ensure that it remains consistent and efficient.	4.22	Strongly Agree	Very High Level
3. My household is proactive in identifying patterns in water consumption and making adjustments if necessary to reduce waste.	4.28	Strongly Agree	Very High Level
4. We use water consumption data to identify opportunities for implementing water-saving practices or installing efficient appliances.	4.20	Strongly Agree	Very High Level
5. My household feels confident in our ability to effectively manage and control our water consumption based on regular monitoring.	4.23	Strongly Agree	Very High Level
Section Mean	**4.24**	**Strongly Agree**	**Very High Level**

The survey results on household water consumption monitoring practices are given in Table 2.3. Data shows a reasonably high level of water usage monitoring among the respondents. The item that received the lowest mean score among all the items was No. 4, "We use water consumption data to identify opportunities for implementing water-saving practices or installing efficient appliances," with a mean score of 4.20. Although rated as "Strongly Agree" and "Very High Level," this score indicates a possible disconnect between tracking data around what is being done with the information.

This lower score could suggest that even if residents do actively monitor their daily water use, they may not have the tools, knowledge, or motivation to use that information in ways that reduce their water use. Potential contributors may be a low awareness of modern conservation technology or a challenge to translate consumption data. In contrast, consistently high scores for the other items indicate good engagement in monitoring water consumption. Most notably, Item 3, My household takes the initiative to identify trends in water use and adjusts as needed to avoid waste, led with a mean score of 4.28. This suggests that residents are overall mindful of their consumption habits and are ready to change their behaviors accordingly.

These findings indicate that future water-conservation projects may be improved by the inclusion of data-driven decision-making tools. Smart meters, mobile applications, or personalized feedback reports are examples. Supporting residents with that information could help them turn their monitoring efforts into more effective water-saving behavior. Within the UN Sustainable Development Goals, substantial social, political, economic, and managerial (agencies, governmental relationships, and decisions) (UN, 2023) issues are defined between water management and sustainable development. According to the circular economy, water management is an important component of a sustainable development strategy built with the "reduce, reuse, recycle, reclaim, recover, and restore" approaches (Kakwani & Kalbar, 2020).

Table 2.5
Current Patterns of Water Consumption for these Households in terms of Peak Consumption Periods

ITEMS	WEIGHTED MEAN	DESCRIPTIVE RATING	VERBAL INTERPRETATION
1. My household feels that we successfully manage water usage during peak periods without compromising essential daily activities.	4.18	Strongly Agree	Very High Level
2. We actively monitor our water usage during peak consumption times to prevent overuse and avoid strain on the water supply.	4.20	Strongly Agree	Very High Level
3. My household manages water consumption effectively during peak periods by using water-saving devices or shifting usage to off-peak times.	4.17	Strongly Agree	Very High Level
4. During peak water usage periods, we take extra steps to reduce our consumption, such as limiting nonessential water activities.	4.18	Strongly Agree	Very High Level
5. My household is aware of the peak water consumption periods (e.g., summer or specific days of the week) and adjusts our usage accordingly.	4.23	Strongly Agree	Very High Level
Section Mean	**4.19**	**Strongly Agree**	**Very High Level**

Item 3, which queried households regarding the practice of active management of water consumption during peak periods through water-saving devices or by postponing water usage to off-peak hours, received the lower mean score of 4.17 and therefore signifies the lowest level of agreement. This is still an excellent response, indicating a 'Strongly Agree' and a 'Very High Level' of management, but it will perhaps make it harder for some residents to apply practical water-saving measures during peak times. It could be that residents know what days have the highest water usage, but they don't know how to change their habits. These barriers could range from insufficient access to water-saving appliances, rigid domestic routines, or minimal motivators to change behavior.

Breaking down these barriers through education, incentivization, or infrastructure enhancement could make a notable difference in managing water during high-demand times. Meanwhile, scores across all items consistently rated highly; this suggests that there is a strong awareness of peak consumption times as well as a willingness to modify water usage. But so far, Item 5, asking whether they alter the way they use based on peak times they know of (for example, summer or certain days of the week), had the highest mean score: 4.23. We know pretty well what peak water consumption looks like, so it is an encouragement when a team at a specific site commits to being responsible about water use at peak cycles. That could be residents already being willing to conserve water. It means that residents are already open to conserving water.

Definitely, additional engagement via tailored initiatives, like level of consumption-based pricing, informational campaigns, or rebates for more water-use efficient appliances, can act in optimizing their capacity to complete such a management of water consumption. As the residential sector is a key consumer of water in cities, water authorities and policymakers are aware of the importance of understanding household water usage patterns. A knowledge of how, when, and how much water people use in their homes is required to build effective demand-side management strategies and help inform future aspirations in urban growth. Such intelligence is essential in order to encourage water conservation methods and to devise effective water demand management practices. Accurate water demand estimates also aid the water authorities to plan and size new and amend existing systems (Cominola, 2023).

Table 2.6
Overview of Current Patterns of Water Consumption for These Households

ITEMS	WEIGHTED MEAN	DESCRIPTIVE RATING	VERBAL INTERPRETATION
1. Monthly Water Consumption	4.27	Strongly Agree	Very High Level
2. Activities for the use of Primary Water	4.25	Strongly Agree	Very High Level
3. Consumption Monitoring	4.24	Strongly Agree	Very High Level
4. Peak Consumption Periods	4.19	Strongly Agree	Very High Level
Section Mean	**4.24**	**Strongly Agree**	**Very High Level**

Summary of water consumption patterns (current) for these households (Table 2.5). The management of 'Peak Consumption Periods' (Item 4), on the other hand, had the lowest mean value of 4.19. Residents still 'strongly agree' and see it as a 'very high level' of concern despite this. The grand mean score (4.24) indicates a general adherence to water-related practices in all the categories mentioned, with a consistently high engagement with these practices. This indicates residents' engagement in managing their water use, water use activities per month, primary activities involving water use, and inspections. But this also suggests a major need for water conservation measures specific to the community.

The overall category high scores in these metrics of monthly water consumption and primary water use suggest that additional education, incentives, or changes in infrastructure can encourage households to adopt more sustainable practices when it comes to water usage. The slightly lower score for 'Peak Consumption Periods' (4.19). This still indicates a strong level of agreement; however, it implies that residents may not view management of peak periods as the priority in comparison to their overall monthly use of water. This may indicate that residents focus on reducing their overall water consumption and not necessarily on changing behavior during peak usage times. This could be attributed to a number of reasons, ranging from being unaware of peak consumption or being unable to adjust household routines so that water consumption takes place during periods of off-peak hours.

That is the only way to manage water sustainably over the long run, in an environmentally sound manner. This includes bald-making water reclamation and reuse, which will help us maximize our existing resources, and exploring alternatives to municipal water consumption, such as using harvested rainwater for non-potable uses, to help ease the strain on municipal supplies. Also integrating systems like greywater recycling, reusing wastewater within houses, and also providing a stronger and more sustainable basis of water management (Fletcher et al., 2013). For instance, such systems can be used for toilet flushing and garden irrigation, thus decreasing the pressure on treated municipal water.

Water Conservation Strategies that best fit the Demographic Profile and Current Consumption

1. Campaign and Awareness

Educational efforts on household water-saving methods could be initiated as monthly water consumption is generally known and could promote further savings. These could include: (a) Educating About Water-Saving Practices: For example, encouraging residents to take shorter showers or to fill the dishwasher and washing machine whenever possible or to turn off the faucets when washing hands or brushing teeth; and (b) Data on Effective Appliances: Encouraging the installation of water-saving machines and appliances, including energy-saving washing machines, dual-flush toilets, and low flow showerheads.

2. Installation of Water Metering and Monitoring Systems

Water meters will be installed in houses to help homeowners become aware of peak consumption hours and keep track of their water consumption. This real-time data, in turn, can provide valuable feedback to residents and empower them to recognize usage spikes and alter their habits with ease. Smart water meters can also alert residents to the excessive use and inefficiencies: (a) Installing By knowing peak consumption times, homeowners can install water meters in their houses, which will help them assess their water consumption; and (b) This not only gives residents the power to manage their own water use, but it also provides authorities with crucial data on usage consumption that can be leveraged to help plan water use in the future.

3. Rainwater Harvesting Systems

Rainwater harvesting systems would be the best option towards avoiding the dependency on the domestic water source in specific, especially at peak times. Homes could install rainwater collection systems to collect and store rain to use for non-potable uses like cleaning or watering the garden in the rainy season.

4. Peak Period Water Conservation

For homes that have determined when they consume the most, demand-side management techniques could be deployed. Possible strategies include:

Shifting Non-Essential Water Use: Asking homes to shift non-essential water use (like lawn watering or car washing) to non-peak times so as not to flood the water supply.

Time-of-Use Pricing: Price scales that reduce the price of water per household when less water is drawn and increase during peak hours.

Ask households to move non-essential water use (for example, lawn watering or car washing) to off-peak hours to prevent over-demand on the water supply network in peak periods.

5. Incentives for Devices that Save Water

Local governments or utilities could also offer rebates or other incentives for the purchase of water-efficient fixtures, such as low-flow showerheads, faucets, or toilets. This would reduce the substantial costs of entry into conservation and expose water-efficient technologies to more homes.

6. Community Outreach and Support

To further inculcate the virtue of social responsibility, the organization of neighborhood challenges or local workshops on conserving water would also go a long way, since the positive response from the community to social causes has been repeatedly validated by the collaborative nature of the society. Having access to information and events that showcase water-saving practices could inspire residents to take greater conservation actions. Successful water conservation programs that focus on the community often include school efforts, social media efforts, and neighborhood competitions for the least water waste. Engaging the leaders and organizations they trust can foster participation and instill a lasting change in their behavior.

7. Infrastructure Improvements

Finally, making improvements to the community water infrastructure, such as repairing breaks in pipes or adding water-efficient irrigation systems to community gardens, would ultimately decrease total water usage. If water distribution systems are more efficient and leakage is reduced, then the community will save more water with less effort.

DATA INTERPRETATION

Current Water Consumption Patterns in Barangay BF Homes Phase 1

1. Monthly Water Consumption

The highest mean score among the items is 4.27 on the item 'Monthly Water Consumption,' which is 'Very High Level' (Strongly Agree). In conclusion, it can be concluded that the households in Barangay BF Homes Phase 1 consider that their monthly water usage is always high. It could indicate that poor usage habits or unsustainable water management practices in the community result in excessive consumption.

2. Peak Consumption Periods

Understanding when peaks of consumption occur enables targeted conservation efforts. Such as encouraging use during off-peak periods, adjusting pricing structure to reward lesser demand at peak periods, and recommending water-efficient appliances and irrigation practices for high-demand periods. Factors such as household size, income levels, and occupation schedules of Barangay BF Homes Phase 1 may also be mapped to these consumption patterns. Bigger households, for example, may have stronger peak times that occur at the same time because they consume a lot of water in the mornings and evenings.

The comparatively low score posted for peak consumption periods may suggest that if the average resident knows about water conservation in an abstract sense, its practice during day-to-day routines like showering, washing dishes, and doing laundry proves difficult to apply. In these areas, conservation may take a back seat to habitual behaviors and convenience. Nevertheless, such consistently high scores do signal a strong general awareness and commitment to water conservation among residents, which could be a good basis for introducing more water-saving programs. There is a high level of consonance with conservation behaviors, indicating that any future policies to discourage wasteful water use or educational campaigns are likely to be accepted and effective at prompting the more sustainable watering behavior.

Implications and Recommendations

1. Increased Awareness and Opportunity for Targeted Programs. The high rating for your monthly water consumption suggests that they are probably aware of how much water is used by households. This newfound awareness creates an opportunity to direct resources to programs that monitor and possibly reduce water use.

2. Need for Water Conservation Programs. As a result of the perception of high-water usage, there's definitely a need for water conservation programs. Households should be educated about means of using water in an efficient and conserving manner to avoid wastage.

3. Strategies for Managing Peak Consumption. Respondents acknowledge peak periods of water use, but the slightly lower score means greater potential for improvement in the management of peak demands. Implementing targeted water-saving measures in these periods can ease the burden on water supply infrastructure.

4. Potential for Water Use Monitoring and Regulation. The respondents feel positive about water consumption monitoring, indicating that they are open to monitoring and regulating their water consumption.

5. Proactive and Reactive Water Consumption Regulation. Implementing tools or systems for enhanced water use tracking presents opportunities to reactively and proactively regulate water consumption, enabling the identification of trends and areas where improvements can be made.

6. Policy Considerations and Municipal-Level Strategies. Water management strategies at the municipal level can be informed by these findings. Heavy consumption of water means that sustainable water management policies and efforts to enforce responsible water use through incentives and awareness programs may be warranted. All in all, these implications highlight the need for a systematic response to high water consumption. This must strike a balance between the need for more efficient use of water and interventions that will promote better management and conservation.

7. Implementing Water Conservation Strategies: The current investigation of water consumption patterns in Barangay BF Homes Phase 1 offers valuable insights into household behavior, based on residents' perceptions of their water usage. These survey responses provide a detailed understanding of home water use, enabling researchers to identify opportunities for implementing effective water conservation techniques and broader groundwater-saving strategies.

INTERPRETING FINDINGS

High monthly water usage in Barangay BF Homes Phase 1, together with residents' strong knowledge about water-saving methods and determination of its peak consumption periods, calls for the implementation of water conservation measures. While awareness of conservation directly impacts households, peak consumption remains challenging, and changing the behavior permanently takes time. Infrastructure improvements, like leak detection systems and pipe repairs, in tandem with promoting water-efficient technologies like low-flow toilets and showerheads, also help ensure that we are not wasting water. Moreover, educational initiatives that promote behavioral changes, like using water more effectively at peak times and fostering awareness regarding consumption, can further support conservation efforts.

Out of these strategies, enhancements to infrastructure and the introduction of water efficient technology will provide the quickest return through a decrease in water waste at the source. Ultimately, this relies not just on providing information but on long-term educational and community-based processes. Implementing these strategies would help Barangay BF Homes Phase 1 to lower the total consumption of water, providing sustainable access to clean water for future generations. This requires the active collaboration of residents, local governments, and water suppliers to achieve long-term conservation goals. The solution is saving water by investing in water saving infrastructures, creating responsible consumption behavior, and formal policy implications.

Table 2.7
The Residents' Awareness Levels and Attitudes Toward in terms of Methods to Conserve Water

ITEMS	WEIGHTED MEAN	DESCRIPTIVE RATING	VERBAL INTERPRETATION
1. I am aware of various methods to conserve water, such as using water-efficient appliances, fixing leaks, and reducing water usage in daily activities.	4.29	Strongly Agree	Very High Level
2. My household actively adopts water-saving practices, such as using low-flow showerheads, reducing shower times, or using a broom instead of hosing down driveways.	4.24	Strongly Agree	Very High Level
3. I believe that conserving water is important for the environment and the sustainability of our water resources.	4.21	Strongly Agree	Very High Level
4. My household is willing to invest in water-efficient devices or appliances to reduce our overall water consumption.	4.17	Strongly Agree	Very High Level
5. I feel that educating residents about simple water conservation techniques would help the community reduce overall water consumption.	4.31	Strongly Agree	Very High Level
Section Mean	**4.25**	**Strongly Agree**	**Very High Level**

Item 4—willingness of the household to invest in water-efficient devices—had the least mean score of 4.17. This implies that although residents appreciate what these devices offer, cost pressures or doubts about their ongoing cost-effectiveness seem to be preventing them from being widely adopted. Limited access to affordable water-saving technology also could be a factor, or a lack of awareness about available incentives. Finally, the wide range of 'Very High Level' and 'Strongly Agree' with the mean of 4.25 in all sections of knowledge and practice indicates well-awareness among residents who study with 68 months of use of knowledge and attitude towards water-saving techniques.

That implies that awareness campaigns have worked to teach the community. But now, on the other hand, awareness is not also action, right? What we need is to focus on deploying behavioral nudges or policy incentives that will promote long-range conservation strategies. The willingness to invest in buying a water-efficient device is a significant point of this survey despite this high awareness. That's consistent with other findings in the study, which suggest practical obstacles such as cost, convenience, or the lack of infrastructure can keep residents from effectively applying conservation strategies, even where residents appreciate the value of conservation. How do we narrow this gulf between what we know and that which we do? Incentives such as rebates for water-using appliances, community education initiatives, and affordable financing plans would be quite useful.

Promoting behavioral change at the consumer level alongside structural change to address market failures will be vital to ensure a sustained culture of water conservation. Policies and regulations also must be established for sustainable water management. Finally, establishing strong policy and regulatory frameworks is essential for sustainable water management. These include appropriate policy and regulatory measures starting from government water pricing that reflects the true opportunity cost of water, usage limits to lessen demand where supply is constrained in poverty pockets, and tax breaks or financial rebates to assist conservation projects. According to Brooks (2006), these measures serve as a precursor to uniform and effective water saving. One such strategy, tiered water pricing, would encourage consumption reductions by raising costs on higher volumes of use.

Table 2.8
The Residents' Awareness Levels and Attitudes Toward in terms of Methods to Conserve Water

ITEMS	WEIGHTED MEAN	DESCRIPTIVE RATING	VERBAL INTERPRETATION
1. My household has adopted practices that reduce water consumption, such as using shorter showers, full loads for laundry, and using a broom instead of hosing the driveway.	4.23	Strongly Agree	Very High Level
2. We limit our water usage for non-essential activities, such as watering the garden during peak sun hours or using the dishwasher only with full loads.	4.29	Strongly Agree	Very High Level
3. My household regularly checks for and repairs any leaks in pipes, faucets, or toilets to prevent unnecessary water waste.	4.35	Strongly Agree	Very High Level
4. We practice water-saving behaviors, such as turning off the tap while brushing teeth or using a bucket to wash the car instead of a hose.	4.29	Strongly Agree	Very High Level
5. My household consistently uses water-saving devices, such as low-flow showerheads, faucets, or toilets.	4.34	Strongly Agree	Very High Level
Section Mean	**4.30**	**Strongly Agree**	**Very High Level**

It had the lowest mean score of 4.23, Item 1, which looked at household practices including taking shorter showers, doing full loads of laundry, and sweeping instead of using a hose. This indicates that although people are knowledgeable about water-saving methods, the actual implementation of practices is difficult, due to factors such as convenience, habit, or simply not thinking small changes matter. For example, some households may value convenience more than conserving water or may downplay the collective effect of those small changes. (4.30) indicated that overall residents had 'Very High Level' (or 'Strongly Agree') commitment to water-saving practices.

This really indicates widespread adoption of water conservation in the community and that the current efforts are working well." If we want to keep these trends going, we might consider strengthening people's motivation through really targeted incentives or through policy-related interventions. These findings correlate with the strong awareness of water conservation techniques we observed previously. The only referent of these no-no's was how infrequently they're practiced in homes, even though they're all well-known—and that's the crux of the matter: Knowing what to do doesn't necessarily lead to doing it. The knowledge-action gap is essential for informing future conservation programs aimed at creating habits and reinforcing positive behaviors.

To drive water conservation even further, we have to seek out how we can close those gaps in implementation. That may mean making incentives for water-saving behaviors more accessible, increasing community engagement, and providing practical workshops on how to use water more efficiently. Beverage companies have a unique opportunity to partner with NGOs to create educational programs to support outreach campaigns, leveraging multiple channels to raise awareness and promote sustainable water-saving behaviors as part of everyday life through awareness and action. Daily water use in homes runs in the tens of liters, but there is a trend towards lower levels recently (Skipton et al., 2013). This decline is mostly due to the adoption of modern, water-saving fixtures and appliances. Even so, the average American continues to consume between 70 and 100 gallons of water daily.

Table 2.8
The Residents' Awareness Levels and Attitudes Toward in Terms of Water Restriction due to Water Disruptions

ITEMS	WEIGHTED MEAN	DESCRIPTIVE RATING	VERBAL INTERPRETATION
1. My household is prepared to follow water restrictions during times of water disruptions and adjust our water usage accordingly.	4.37	Strongly Agree	Very High Level
2. We have implemented strategies, such as using water efficient appliances, to minimize our water consumption during water restrictions.	4.19	Strongly Agree	Very High Level
3. During water disruptions, my household is proactive in reducing nonessential water activities, such as limiting outdoor watering or reducing shower times.	4.29	Strongly Agree	Very High Level
4. We stay informed about any water disruptions or restrictions in our area and take action to minimize water use during these times.	4.25	Strongly Agree	Very High Level
5. My household understands the importance of water conservation during water disruptions and feels motivated to adopt additional water-saving measures during these times.	4.30	Strongly Agree	Very High Level
Section Mean	**4.28**	**Strongly Agree**	**Very High Level**

Item 2, which covered using water-efficient appliances for reducing consumption during water restrictions, scored the lowest mean score of 4.19. While still indeed in the 'Very High Level,' a.k.a. 'Strongly Agree,' category, this indicates that there could be barriers to ultimately causing these appliances to go 'live' in the wild. This lower score might mean that people face financial or logistical barriers when trying to adopt them. So, despite a relatively high level of general awareness of water conservation, factors such as cost, accessibility, or even a sense that they're not really needed could be preventing widespread adoption.

By contrast, the mean scores were high across the other items, indicating that residents are mostly very willing and prepared to adjust their water use during disturbances. This reflects a well-informed culture of water conservation and a high level of backing for restrictions. This is in keeping with what we know about their general water conservation habits. And, while people can change their habits, solutions that are dependent on infrastructure, like water-saving devices, may need a kick or motivation. Overall, there is a very high awareness of the need for continuity of water supply and for conservation in disruption times (average response 4.28 ('Strongly Agree') across most respondents). In general, there is a very high awareness of the need for continuity of water supply and the need to conserve water during times of disruption (with an average response of 4.28 ('Strongly Agree') across most respondents).

Households are prepared to comply with restrictions, as evidenced by the item with the highest score (4.27). But the lower score for water-efficient appliances (4.19) reflects such potential barriers as cost or accessibility. This indicates a move toward water conservation, but it also points out that we need to focus on supporting solutions related to infrastructure. Public education, awareness campaigns, and incentive programs are key; we need to really optimize water-saving methods. Education about diverse conservation techniques is needed. This can also involve other measures such as providing financial incentives to promote water-efficient behaviors, raising awareness on global water scarcity through educational initiatives, or increasing national and public pressure on the issue. Like the approaches mentioned by Hurlimann and Dolnicar (2010), they are crucial.

Table 2.9. Summary Residents' Awareness Levels and Attitudes Toward

ITEMS	WEIGHTED MEAN	DESCRIPTIVE RATING	VERBAL INTERPRETATION
1. Methods to Conserve Water.	4.25	Strongly Agree	Very High Level
2. Water Saving Practices.	4.30	Strongly Agree	Very High Level
3. Water Restriction Because of Water Disruptions.	4.28	Strongly Agree	Very High Level
Grand Mean	**4.28**	**Strongly Agree**	**Very High Level**

The table sums up a survey of residents' awareness and attitudes and shows a strong consensus on the need for water conservation. 2. The highest score, 4.30, was obtained for the 'Water-Saving Practices' category, which reflects a good understanding and acceptability of such behaviors. In fact, 'Water Conservation Techniques' received a score of 4.25, slightly lower but still in the 'Very High Level' of agreement. A grand mean, or overall average, of 4.28 on water restrictions indicates that residents are very aware of the need to conserve water. Such awareness is likely from previous water disruptions, shortages, or local policies. It's not just knowing, though; people appear to comprehend why they should adhere to restrictions. This awareness was also consistent with what we saw earlier on in other areas of the study.

For instance, people who have had water cuts in the past tend to be more conservation-minded. We also notice a potential relationship between education levels and knowledge of water-saving measures. Note that in this study, a 'very high level' only refers to people who have not only heard of the concept of water conservation but who are also likely to do it. They understand the significance and are eager to act. As a result, to parse it out a bit: 'Water-Saving Practices' (4.30) indicates that folks are adopting conservation behavior, while 'Water Conservation Techniques' (4.25) shows people might need clearer info about being more efficient. The fact that the overall mean is 4.28 informs us that residents are highly aware of water restrictions, likely because of previous experience.

This fits with the overall trend of the study: the more familiar people are, the likelier they are to conserve. It does make you wonder, though, if these attitudes will catch on long-term. This can be as simple as implementing water-saving fixtures and appliances in homes and businesses. It's really just a matter of selecting the right pieces and installing them; no major renovations are required. Not only will these fixtures help the country save gallons of water, but generations will also save money on utility bills. Another quick and easy way to make a difference: Replace old, high-flow fixtures with low-flow models. And it eases the burden on water treatment and distribution systems, meaning energy savings (Biggs 2017).

IMPLICATIONS

a. **The Public Supports Water Conservation.** The high scores indicate that residents realize conservation is key. This means any public campaigns and initiatives are likely to go down well.

b. **People Support Water Conservation.** When individuals are aware of their water usage, they are more likely to adopt, and keep up, water conservation habits. We also need to use this opportunity to encourage wise water use and establish new habits.

c. **Opportunity for Increased Action.** The low score on 'Water Conservation Techniques' indicates an opportunity to articulate better and to be more actionable with respect to the messaging of conservation. We have to bring information to bear in an uncomplicated manner in a way that resonates in various households.

d. **Focus on Clear Communication.** People realize they need restrictions during disruptions. This means that we can devise ways to better communicate in those times and secure cooperation.

e. **Invest in Infrastructure.** The People realize they need restrictions during disruptions. This means that we can devise ways to better communicate in those times and secure cooperation.

f. **Strategic Planning for Long-Term Sustainability.** The existence of high awareness and support lays the ground for sustainability in the long term in water management. It means continuing education and utilizing and adopting new technologies, whatever the impact.

Overall, there is much goodwill in the community to keep water conservation front and center and to support ongoing programs, expand policies, and work toward a sustainable water future.

Table 2.10
Significant Relationship Between Household Demographics (Household Size and Monthly Income) and Water Consumption Levels in Phase 1, Barangay BF Homes

Paired Samples Correlations				
		N	**Correlation**	**Sig.**
Pair 1	Household Demographics & Water Consumption	6	.948	.001

The coefficient correlation of 0.948 indicates a very strong positive relationship between household size, monthly income, and water consumption. That means as household composition (size or income) goes up, water use tends to increase in a predictable manner. In addition, the chance of this finding being a random occurrence is all but zero (using a p value < 0.05]). This demonstrates that demographic factors are a strong indicator of the water consumption in Barangay BF Homes Phase 1. Future research should investigate whether this association persists in other socioeconomic tiers and geographical regions.

To conclude, there is a strong association between household demographics and consumption of water, whereby larger households and households with higher incomes are more likely to have higher water consumption. This raises an important question: Are higher-income households more water-conservative, or does more financial flexibility lead to more water use? Additional analyses may consider the extent to which income modulates investment in water-efficient appliances or the willingness to adhere to conservation regulations. This part explores the correlation of household demographics, specifically household size and monthly income, to the water consumption level of households in phase 1, Barangay BF Homes.

The results show that these demographic factors correlate strongly positively with water usage. The Local Water Utilities Administration (LWUA) is in charge of formulating the standards on household water consumption and supervising provincial waterworks in the country. According to the report titled 'Reducing Non-Revenue Water' by the Local Water Utilities Administration (LWUA) dated 2019, it provides a compilation of data on national household water consumption patterns, and these are classified depending on the degree of urbanization, which can be highly urbanized, cities, municipalities, or barangays in rural areas.

REPORTING AND PRESENTING RESULTS

Household demographics had a significant impact on all water consumption patterns in the conclusions of the study. The influences of specific demographic variables, including household size, income, or location, can also be useful for targeted water conservation plans. Water utility providers and policymakers can use this data to tailor programs that address the needs of different demographic groups, enabling more judicious water consumption.

Larger families, for example, might require different conservation strategies than smaller ones, and income levels could influence the affordability and adoption of water-saving technology. Thus, our findings underscore the need to take demographic factors into account when planning and educating on water conservation to achieve a more water-efficient and equitable water use. It also shows the need for more studies to better understand how various demographic characteristics relate to water use and inform guidelines for sustainable water consumption.

Table 2.11
Reducing Water Demand with Strategies: The Role of Perceived Efficacy

VARIABLES	MEAN	SD	R	p-value	Interpretation
Perceived Efficacy and Water - Saving Strategies	4.22	0.11	0.97	00000	Significant*

** Significance at 0.05 p-value level*

(As shown in Table 2.11) shows a very strong positive correlation (r=0.97) between perceived efficacy and strategies to save water. That means that those who strongly believe in their capacity to save water are more than four times more likely to save water. This correlation has a statistically significant p-value < 0.05, which means that the relationship is not due to chance. Table 2.11 shows the positive relationship between perceived efficacy and water-saving strategies. The meaningful and significant correlation suggests that personal belief in saving water may positively add to their responsibility of saving water.

The high mean score of 4.22 for perceived efficacy level and 4.24 for implementation of water-saving strategies reflects that respondents believe that they are able to conduct water saving actions and that they actively engage in such strategies. Low standard deviations derive a small variation in answers, which indicates a good agreement between participants. Perceived efficacy in this study is defined as an individual's confidence in their ability to successfully adopt strategies to save water. This high level of perceived efficacy indicates that residents perceive themselves capable of perennial water capital conservation, which reflects on their actual saving behavior.

This positive correlation (r = 0.97) complies with previous findings, meaning that individuals with a higher sense of perceived efficacy are more likely to implement water-saving strategies. Additional analysis could look at whether perceived efficacy differs by demographic groups, including income or education level, and the extent to which it is reflected in actual water consumption reductions. Table 2.2 Relationship between perceived efficacy and water-saving strategies. Results show a strong positive correlation ($r = 0.97$, $p < 0.05$) between belief in water-saving abilities and actual water-saving measures implemented.

This shows that respondents have a high sense of ability to save water (a mean score of 4.22) and practice water-saving strategies (a mean score of 4.24). Results presented in prior sections of this study, emphasizing the role of individual confidence in sustainable water use, are consistent with these findings. Future research might examine which demographic characteristics correlate with the perceived efficacy of self-efficacy and whether increased self-efficacy produces statistically significant differences in actual water use. Therefore, if data-driven system operator engineering techniques reduce the loss of water and ensure the availability of clean water, it would involve in-water distribution system refuges and the system yield, water distribution system pressure (World Health Organization (WHO), 2017).

This includes both maintaining and improving infrastructure and changing how the water delivery system operates. The study concludes that increasing people's perceptions of the efficiency of water-saving measures is likely to significantly support promoting water conservation use behaviors. Such a high association noted between perceived efficacy and adoption indicates that people's tendency to adopt water-use-saving techniques is higher if they expect that they would be able to successfully apply such techniques. Using this data, schools, environmental organizations, and policymakers can design targeted education and awareness campaigns that increase confidence in people's ability to conserve water.

When these organizations are able to raise awareness surrounding water conservation efforts, it enables greater participation, which helps lead to increased water consumption reductions and greater sustainability in water resource management overall. The right types of specialized, accessible, water-saving technologies that instill confidence in the communities and individuals to take action are also something discussed in the report. Table 4.12. It was found that there was a significant relationship between the perceived control and water conservation efforts; when they are taking action, they feel themselves in control, so their attempts to change their use behavior will increase, which signifies and motivates them for certain water-saving behaviors (i.e., taking shorter showers), which will eventually help you eliminate irrelevant water usage.

Table 2.12
Significant Relationship Between the Perceived Control and Water Conservation Efforts

VARIABLES	MEAN	SD	R	p-value	Interpretation
Perceived Control and Water Conservation	4.47	0.18	0.95	0.00045	Significant

** At the 0.05 level of significance*

Table 2.3: Comparison between perceived control and adoption of water management behaviors. High average scores (4.47 on perceived control and 4.54 on water conservation efforts) suggest that respondents tend to feel a high level of control in the use of their water and actively practice water conservation efforts. The small standard deviations indicate that the responses were closely aligned, demonstrating a strong belief in the ability to influence the amount of water that is conserved. Throughout this study, perceived control refers to a person's belief that he/she can control/affect the

water usages of his/her household. Believing we can make a difference goes a long way—and tying a strong sense of control to a higher willingness to conserve within ourselves can really finalize our notes on sustainable water practices.

This high correlation ($r = 0.95$) is in accordance with the preliminary findings that respondents perceived to be more effective also practiced water-saving behaviors more often. That's something that could be looked at in further analysis, like how the degree of perceived control when it comes to water conservation might vary based on someone's income or educational level or whether they have experienced water shortages before. A strong positive correlational relationship was found between perceived control and water conservation ($r = 0.95$) (see Table 4.12). In other words, people who think they can control their water use are much more likely to conserve. Confirming that this relationship is unlikely to have occurred by chance, the statistical significance ($p < 0.05$) showed. The high mean scores (4.47 for Perceived Control and 4.54 for Water Conservation Efforts) indicate that respondents generally feel empowered to manage their water use effectively and actively participate in conservation strategies.

These findings align with previous results in the study, highlighting the role of psychological factors in promoting sustainable water consumption. Future studies should also investigate how demographic factors affect perceived control and whether tailored interventions—such as awareness campaigns or economic incentive programs—can expand the feeling of control over their water use among individuals. Before getting into particular methods of consumption, it is useful to know, namely, what the world's population will demand to meet their basic need for water over the next three decades. For assessing these needs, The Sphere Association's "The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response" (2018) is a good place to start. Although developed in a humanitarian context, these criteria are an important reference point for understanding the significant water requirements of all types of households.

An especially powerful insight from the study is that when people have a greater sense of control over their use of water, they are much more likely to participate in conservation! Basically, people are far more likely to take action if they feel they can have a direct impact on their water use. It suggests that interventions designed to provide tangible tools and information—real-time water monitoring technologies, say, or simple, practical techniques of management—could go far. This result has important implications for policymakers and environmental organizations. Our campaigns and programs will then shift toward developing confidence in the individual belief in conservation of water. For example, action could be focused on things such as ensuring people have the firepower and knowledge of low-hanging fruit options they have to track and manage water use and reduce wastage. By doing this, the ultimate goal is to create a sense of control, which can have wider and persistent engagement with water conservation, ultimately leading to sustainable management of water resources.

CONCLUSION

Barangay BF Homes Phase 1 presents significant opportunities for enhancing water conservation through increased awareness, technology adoption, and community engagement. The demographic profile underscores the need for tailored interventions, as households consume a high volume of water, which calls for targeted conservation efforts. The community is well-positioned to embrace water-saving practices, with strong awareness and positive attitudes toward water conservation. Furthermore, understanding peak water usage times provides a solid foundation for implementing effective measures. It is crucial to consider demographic factors when analyzing water use patterns, and enhancing residents' self-confidence in their water-saving abilities, along with fostering a sense of control over their water consumption, will encourage the adoption of sustainable practices. The findings also highlight the need for a collaborative approach between local government units and residents to develop long-term, impactful water conservation solutions. By cultivating a culture of responsibility, providing accessible water-saving technologies, and promoting continuous education on water management, the community can reduce water wastage and work toward a more sustainable future. Ultimately, the success of these initiatives will depend on the active participation of all stakeholders, fostering a shared sense of ownership over the community's water resources.

Recommendations

Based on the conclusion, the following recommendations were made.

1. Develop financial incentives for implementing water-saving technologies.
2. Install smart water meters and conduct educational campaigns.
3. Promote water-saving practices within the community.
4. Encourage rainwater harvesting and support environmental conservation.
5. Examine the relationship between household demographics and water usage patterns in future research.
6. Integrate water-efficient infrastructure in new construction.
7. Incorporate water conservation subjects into educational curricula.

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