

Customers' Acceptance and Willingness to Pay for Mandated Septage Management Services of Calamba Water District

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Abstract. Through its practical implications for the field, this study evaluated customer acceptance and willingness to pay for the mandated Septage Management Services provided by the Calamba Water District (CWD). The research, conducted with a rigorous descriptive correlational research design, focused on various factors: awareness and understanding, perceived importance, regulation compliance, and payment preferences. The ultimate goal was to develop an action plan to enhance customer awareness of the importance of septage management and foster a more informed, engaged, and accepting community. The study population comprised customers of the Calamba Water District, with respondents selected through simple random sampling. A total of 385 customers who had adequate awareness of wastewater management and had serviced their household septic tanks were included in the study. Descriptive statistics, including means and Likert scales, were used to describe customer acceptance and willingness to pay for septage management services. The Pearson Product-Moment Correlation was utilized to determine the relationship between customer acceptance and willingness to pay for these services. The findings revealed a significant relationship between customer acceptance and willingness to pay for CWD's mandated Septage Management Services. Specifically, higher levels of customer acceptance were associated with greater willingness to pay for the services. Conversely, as customer acceptance decreased, so did their willingness to pay.

Keywords: Customer acceptance; Willingness to pay; Septage management services; Water District; Environmental regulation compliance.

1.0 Introduction

Access to clean water and sanitation is a fundamental human right, as recognized by the United Nations Sustainable Development Goals (SDGs), specifically SDG 6, which aims to ensure the availability and sustainability of water and sanitation for all by 2030. This goal encompasses universal and equitable access to safe, affordable drinking water, improving water quality, and enhancing water-use efficiency. These targets are crucial for economic growth, as access to clean water and sanitation is integral to economic productivity and the well-being of individuals and communities. Achieving SDG 6 requires significant water and sanitation infrastructure investments, emphasising community participation and awareness.

Septage management plays a critical role in protecting public health, preserving the environment, and ensuring the sustainability of communities. Rapid urbanization and inadequate integrated sewerage systems have made

proper septage management increasingly essential. The lack of adequate wastewater treatment and disposal systems results in groundwater contamination, the spread of waterborne diseases, and the degradation of aquatic ecosystems. Regulatory bodies often mandate the establishment of septage management programs to address these challenges, shifting the responsibility for proper waste disposal from individual households to centralized systems managed by local utilities.

Globally, inadequate wastewater treatment and disposal systems have led to the pollution of water sources and the proliferation of waterborne diseases. Approximately 80-90% of wastewater is disposed of untreated or partially treated, often using makeshift on-site sanitation systems like septic tanks. This situation is particularly prevalent in developing countries in the Asia-Pacific region, leading to severe pollution of surface and groundwater sources and coastal ecosystems and significant economic impacts.

In the Philippines, only 10% of the 98 million people are connected to a piped sewerage system, with 84% of the population relying on septic tanks for wastewater disposal. A study by Baltazar et al. (2021) indicated that only 12% of septic tanks in the Philippines are regularly emptied, while the remaining 88% are either never or only partially emptied, posing a significant health risk.

The regulatory framework in the Philippines plays a crucial role in wastewater management. The Sanitation Code of the Philippines, also known as Presidential Decree PD 856, provides a comprehensive framework for ensuring environmental sanitation and public health. This legal instrument underscores the government's commitment to nurturing an environment conducive to human well-being and sustainable development. The Philippine Clean Water Act of 2004 (Republic Act 9275) also mandates the establishment of septage management programs at the local government level to address environmental degradation caused by water contamination.

Calamba City, a highly urbanized city in the Philippines, recognizes the importance of proper sanitation management. Consequently, the City Government of Calamba issued Resolution No. 317 Series of 2009, approving City Ordinance No. 456, Series of 2009, entitled "An Ordinance Establishing a Sewerage and Septage Management System in the City of Calamba, Setting Guidelines for its Implementation."

The Calamba Water District (CWD) has implemented mandated septage management services, recognizing their importance. However, a crucial gap exists in understanding customer attitudes towards this service, including their willingness to pay and acceptance. Thus, this study determined the factors influencing customer acceptance of the service, such as awareness, perceived importance, satisfaction, compliance, and trust. Additionally, it examined customers' willingness to pay, considering factors such as perceived value, financial capability, and payment preferences. By exploring the connection between customer perceptions and financial commitment towards mandated septage management services, the study provides valuable insights into the relationship between environmental regulations, service provision, and consumer behaviour. Studying customers' acceptance levels and willingness to contribute financially to the mandated septage management services holds immense significance for CWD's operational strategies and long-term waste management objectives.

Further, this study aims to thoroughly assess the level of acceptance and willingness to pay for mandated septage management services among customers. By comprehensively understanding these factors, the study is designed to provide invaluable insights for policymakers and service providers to develop robust, sustainable, and equitable septage management programs that effectively meet the needs and expectations of the community.

2.0 Methodology

2.1 Research Design

This study employed a descriptive correlational research design, which allowed the researcher to describe and analyze variables and determine if significant relationships exist between them. Descriptive research involves collecting data through surveys to answer questions and summarizing the data to explain existing conditions (Sirisilla, 2023). Correlational research design, on the other hand, measures the extent to which two or more variables are related (Seeram, 2019). Combined, descriptive-correlational research focuses on explaining the relationships between and among variables. This design is appropriate since the goal is to test hypotheses and answer survey questions about the level of acceptance of mandated septage management services provided by

the Calamba Water District and determine customers' willingness to pay for these services. Additionally, it sought to investigate the relationship between these two variables.

2.2 Research Participants

This study's respondents consisted of 385 Calamba Water District (CWD) customers who were appropriately aware of the Septage Management Service and had a household septic tank. The population comprised CWD customers residing in areas where the Septage Management Services are implemented. As of December 2022, there were 66,108 residential customers of CWD. Only those aware of septage management and with a household septic tank were considered respondents for the study. The selection of respondents was carried out through simple random sampling to ensure fairness and minimize potential biases. This method ensured that all eligible customers had an equal chance of being selected for the sample. The sample size was determined using G*Power, with an effect size of 0.182, a margin of error 0.05, and a confidence level of 0.95.

2.3 Research Instrument

The researcher utilized a self-constructed questionnaire to gather data from respondents. The questionnaire was divided into three parts: Part 1 covered personal demographic information, Part 2 assessed the customers' acceptance of the CWD Septage Management Services, and Part 3 determined the customers' willingness to pay for the CWD Septage Management Services. The questionnaire was initially presented to the research advisor for preliminary checking and approval to ensure the instrument's validity. For further validation, the researcher consulted experts, including a statistician, LCBA professors, a data analyst, and a representative from Calamba Water District. These experts provided comments and recommendations to improve the questionnaire's accuracy and comprehensiveness. To ensure the reliability of the research tool, internal consistency tests were performed using Cronbach's Alpha Coefficient. Additionally, pilot testing was conducted with twenty-one customers who were not part of the survey. The feedback and results from the pilot testing were used to refine the questionnaire, ensuring its reliability and effectiveness in gathering the necessary data for the study.

2.4 Data Gathering Procedure

The survey was conducted through face-to-face interactions (for customers unfamiliar with digital tools) and online platforms such as Google Forms. The participants were asked to answer the questions on the questionnaire, which were designed to gather information on the customers' acceptance of the septage management services and their willingness to pay for them. The collected data will be securely stored for a minimum of three to five years following final publication. Upon completion of this period, all digital data will be irrevocably deleted, and all physical data will be shredded or incinerated.

2.5 Ethical Considerations

Ethical considerations were a crucial aspect of this research. The investigator obtained informed consent from the respondents before data collection. The questionnaires were carefully designed to avoid degrading, discriminatory, or otherwise unacceptable language that could offend respondents. They were focused solely on collecting information directly related to the research questions, with no private or personal questions included. This research was guided by the Data Privacy Act (DPA) of 2012, which protects individual personal information. This ensured that the data gathered from the respondents was secured and would be used only for the specific intent of this study. By adhering to these ethical guidelines, the researcher aimed to protect the rights and privacy of all participants. The LCBA Research Ethics and Integrity Council (LCBA-REIC) thoroughly reviewed the responses to the conditions placed upon the ethical approval for this research project and unequivocally confirmed that they meet the rigorous requirements stipulated in the LCBA Research Manual. As a result, full ethical approval has been undeniably granted.

2.6 Data Analysis

Several statistical treatments were employed. Firstly, the Mean and the Likert scale were utilized to describe customers' acceptance and willingness to pay for the septage management services. These measures provided a comprehensive understanding of the central tendency and distribution of responses among the participants. Secondly, the Pearson Product-Moment Correlation was applied to explore the relationship between the level of customers' acceptance and their willingness to pay for the septage management services. This statistical method allowed for assessing the strength and direction of any association between these two variables, providing

valuable insights into the dynamics of customer attitudes and behaviors towards septage management services provided by the Calamba Water District.

3.0 Results and Discussion

3.1 Customers' Level of Acceptance of the Mandated Septage Management Services in CWD *In terms of Awareness and Understanding*

Table 1. Descriptive statistics of the customers' level of acceptance of the mandated septage management services in CWD in terms of awareness and understanding

Indicators	Mean	Interpretation
1. Septage management refers to comprehensive programs for managing septic tanks and the procedures for desludging, transporting, treating, and disposing of septic tank contents.	3.51	Highly Accepted
2. Every household shall have a septic tank for proper septage management and disposal of wastewater.	3.58	Highly Accepted
3. To function appropriately, septic tanks must be cleaned or dislodged before the solids fill the tank's volume or every 3 to 5 years.	3.50	Highly Accepted
4. The improper septage management degrades water quality	3.53	Highly Accepted
5. The improper septage management harms the environment by polluting surrounding water bodies.	3.58	Highly Accepted
6. The improper septage management contaminates groundwater.	3.60	Highly Accepted
7. Improper septage management causes water-related illnesses and hurts health.	3.56	Highly Accepted
Overall Result	3.55	Highly Accepted

Legend: 3.25-4.00 Highly Accepted (HA) 2.50-3.24 Accepted (A) 1.75-2.49 Partially Accepted (PA) 1.00-1.74 Not Accepted (A)

As shown in Table 1, The assessment of customers' acceptance of the Calamba Water District's Mandated Septage Management Services revealed a notably high level of awareness and understanding among respondents, with an overall mean score of 3.55. Notably, Indicator 6, which addressed groundwater contamination due to improper septage management, garnered the highest weighted mean of 3.60, indicating a high level of acceptance among customers. Conversely, Indicator 3, emphasizing the necessity of regular cleaning or desludging of septic tanks, scored the lowest mean of 3.50, still reflecting a high level of acceptance. This suggests that customers possess a strong awareness and understanding of the significance of proper septage management and its associated environmental and health risks. They recognize the importance of individual household responsibility in maintaining functional septic tanks and adhering to proper disposal practices. The acknowledgement of maintenance requirements, such as desludging every 3-5 years, coupled with understanding the adverse effects of improper septage management, may foster a positive attitude toward the necessity of septage management services. Consequently, customers may demonstrate a willingness to support initiatives by the Calamba Water District.

This finding resonates with a study conducted by the Asian Development Bank in 2019, which underscored that communities with heightened awareness about the repercussions of inadequate septage management were more inclined to perceive proper septage management as an urgent necessity. Therefore, the observed high level of acceptance and understanding among Calamba Water District customers aligns with broader trends, indicating the significance of awareness in shaping attitudes towards septage management initiatives.

In terms of Perceived Importance

Table 2. Descriptive statistics of the customers' level of acceptance of the mandated septage management services in CWD in terms of perceived importance

Indicators	Mean	Interpretation
1 Septic tank overflow or leakage contributes to water pollution.	3.52	Highly Accepted
2 Septage management services are essential to public health.	3.59	Highly Accepted
3 Septage management is crucial in combating waterborne diseases and pollution.	3.50	Highly Accepted
4 Septage management services would help gradually improve the city's water quality.	3.56	Highly Accepted
5 Septage management services would aid in the reduction of sanitation-related issues in the city.	3.51	Highly Accepted
Overall Result	3.54	Highly Accepted

As shown in Table 2, the assessment of customers' perceived importance of the Calamba Water District's Mandated Septage Management Services revealed a high level of acceptance, with an overall mean score of 3.54. Notably, Statement 2, emphasizing the importance of septage management services to public health, garnered the highest mean of 3.59, indicating strong acceptance among customers. Conversely, Indicator 3, which highlighted the crucial role of septage management in combating waterborne diseases and pollution, yielded the lowest mean

of 3.51, still reflecting a high level of acceptance. These results illustrate customers' positive perception of the importance of the septage management services provided by the CWD.

Calamba Water District customers recognize the significance of septage management and believe in these services' positive impact on water quality, public health, and overall environmental sustainability. They understand the direct environmental consequences of septage leakage, which can lead to water contamination and the spread of waterborne diseases. This underscores the critical role of septage management in combating waterborne diseases and reflects customers' positive perceptions of its potential to address sanitation-related issues and gradually improve the city's water quality.

Furthermore, these findings emphasize customers' understanding of the interconnectedness of water quality, sanitation, and public health. They also highlight customers' expectations of the long-term positive outcomes of effective septage management services, indicating a comprehensive understanding of the services' potential to address broader societal challenges beyond water quality. Such positive perceptions suggest that customers will likely accept and be more receptive to CWD's septage management services.

The findings are consistent with the study conducted by Baltazar et al. (2021), which highlighted how customers' awareness of the environmental impact and health implications of inadequate septage management directly influence their perceived importance of such services. Similarly, Asmara et al. (2021) emphasized the essential role of public perception in driving acceptance, with communities prioritizing the importance of proper waste management and being more receptive to related initiatives. Positive perceptions can be a foundation for further collaboration between the water district and the community to strengthen septage management initiatives.

In terms of Compliance with Regulations

Table 3. Descriptive statistics of the customers' level of acceptance of the mandated septage management services in CWD in terms of compliance with regulations

Indicators	Mean	Interpretation
1 I know that the Clean Water Act of 2004 mandated the Local Government Unit in partnership with Water Utilities to provide sewerage or septage management services.	3.36	Highly Accepted
2 Failure to comply with the city ordinance regarding septic tank desludging will result in a penalty.	3.33	Highly Accepted
3 Household septic tanks are regularly emptied or dislodged once every 3-5 years	3.37	Highly Accepted
4 If it complies with local ordinances, the Calamba Water District's septage management services can be considered	3.51	Highly Accepted
Overall Result	3.39	Highly Accepted

As shown in Table 3, the assessment of customers' compliance with regulations regarding the Calamba Water District's Mandated Septage Management Services revealed a high level of acceptance, with an overall mean score of 3.39. Particularly, Indicator 4, which highlighted customers' willingness to consider CWD's septage management services if they comply with local ordinances, garnered the highest mean of 3.51, indicating strong customer acceptance. Conversely, Indicator 2, emphasizing the penalties for failure to comply with city ordinances regarding septic tank desludging, yielded the lowest mean of 3.33, still reflecting a high level of acceptance. These results underscore customers' varying awareness of the wastewater regulatory framework.

The data highlight the importance of expanding educational initiatives to better inform the community about the specific provisions and requirements of the Clean Water Act. This includes emphasizing the long-term benefits of adhering to recommended septic tank maintenance and reinforcing the consequences of non-compliance to encourage adherence to regulations. Customers' willingness to consider CWD's septage management services if they comply with local ordinances suggests a positive correlation between community perception and adherence to regulations. Customers are more inclined to support the water district's services if they align with established rules.

This finding is consistent with the study by Dorji et al. (2019), which emphasized that adherence to regulations is crucial for effective waste management. The effectiveness of septage management initiatives relies heavily on community compliance with regulations set forth by local ordinances and national legislation such as the Clean Water Act of 2004. Additionally, Amarille and Balomaga (2021) highlighted the critical role of awareness and

regulatory understanding, noting that compliance with regulations is intricately linked to awareness of their existence and implications. Novillos (2021) offered a micro-level view of regulatory compliance, focusing on households, and recognized that multiple factors, including awareness levels, enforcement mechanisms, and community engagement, influence regulatory adherence. These studies collectively underscore the importance of regulatory compliance and awareness in achieving effective septage management.

In Terms of Satisfaction With Service Quality

Table 4. Descriptive statistics of the customers' level of acceptance of the mandated septage management services in CWD in terms of satisfaction with service quality

Indicators	Mean	Interpretation
1 Calamba Water District provides high-quality service.	3.41	Highly Accepted
2 The CWD's Septage Management Services would be easily accessible.	3.35	Highly Accepted
3 The CWD's septage facilities and equipment are properly designed, installed, and maintained.	3.38	Highly Accepted
4 The CWD has the safe and proper vehicles and equipment to collect and transport the collected septage to its treatment plant.	3.33	Highly Accepted
5 The Calamba Water District's treatment facility complies with the existing standards and regulations, including the disposal of treated septage.	3.39	Highly Accepted
Overall Result	3.37	Highly Accepted

As shown in Table 4, the assessment of customers' satisfaction with the Calamba Water District's Mandated Septage Management Services revealed a high level of acceptance, with an overall mean score of 3.37. Indicator 1, which assessed customers' perception of the district providing high-quality service, yielded the highest mean of 3.41, indicating strong acceptance among customers. Conversely, Indicator 4, focusing on the availability of safe and proper vehicles and equipment for septage collection and transportation, yielded the lowest mean of 3.33, still reflecting a high level of acceptance. These results underscore customers' overall satisfaction with the Calamba Water District's services.

Customer satisfaction is crucial for evaluating the success of Septage Management initiatives, as it reflects the effectiveness of service delivery and infrastructure. The majority of customers express a high level of satisfaction, as reflected in the range of scores falling within the "Strongly Agree – Highly Accepted (HA)" category (3.25-4.00).

The data indicate that customers perceive the services as being performed well and find them easily accessible, well thought out, and compliant with relevant regulations. This suggests a holistic relationship between customer awareness, compliance, and overall satisfaction, emphasizing the importance of a well-rounded and effective septage management program.

Bautista and Sarigumba (2022) emphasized that when individuals perceive services as prompt, reliable, and well-communicated, their satisfaction with the service provider increases. Moreover, satisfied customers are more likely to recognize the value of the services and their role in maintaining a clean and healthy environment. The quality of service directly influences the public's level of satisfaction and, consequently, their acceptance of mandated services. When customers are content with the quality of septage management, they are more inclined to view the services as beneficial and necessary.

In terms of Trust

Table 5. Descriptive statistics of the customers' level of acceptance of the mandated septage management services in CWD in terms of trust

Indicators	Mean	Interpretation
1 I believe the CWD's Septage Management Services is reliable and effective	3.42	Highly Accepted
2 I believe the CWD's Septage Management Services protects the environment.	3.43	Highly Accepted
3 I believe the CWD's Septage Management Services manages poor sanitation problems in the city.	3.35	Highly Accepted
Overall Result	3.40	Highly Accepted

As shown in Table 5, the assessment of customers' trust in the Calamba Water District's Mandated Septage Management Services revealed a high level of acceptance, with an overall mean score of 3.40. Notably, the indicator "I believe the CWD's Septage Management Services protects the environment" yielded the highest mean of 3.43, indicating strong customer acceptance. Conversely, the indicator "I believe the CWD's Septage Management Services manages poor sanitation problems in the city" yielded the lowest mean of 3.35, still

reflecting a high level of acceptance. These results indicate customers' trust in the district's ability to provide reliable and effective septage management services.

Customers perceive the Calamba Water District as capable and dependable in executing its mandated responsibilities, fostering a strong belief in its commitment to environmental protection through septage management services. This positive perception aligns with the increasing importance of environmental stewardship and suggests that the district has successfully communicated its dedication to sustainable practices. However, the lower mean score for the indicator related to managing poor sanitation problems in the city suggests an area that may require focused attention to address any existing customer concerns or misperceptions.

The Metropolitan Naga Water District's progress report (2020) emphasized the necessity of building and maintaining trust among the public. It provided insights into strategic initiatives undertaken by the water district to foster a sense of trust and credibility. Transparent communication regarding program objectives, progress, and outcomes emerged as a vital tool for instilling confidence in the district's actions. The report likely delved into the district's endeavors to implement the septage management program efficiently and effectively, which is instrumental in building customer trust. Such efforts enhance customer perception and trust in the district's ability to manage sanitation issues effectively.

3.2 Customers' Level of Willingness to Pay for the Mandated Septage Management Services in CWD *In terms of Perceived Value*

Table 6. Descriptive statistics of the customers' level of willingness to pay for the mandated septage management services in CWD in terms of perceived value

Indicators	Mean	Interpretation
As a customer, I am willing to avail and pay for the septage management services offered by the CWD if it means better quality and more efficient service delivery.	3.33	Highly Willing
Overall Result	3.33	Highly Willing

As shown in Table 6, the assessment of customers' perceived value regarding the Calamba Water District's (CWD) Mandated Septage Management Services revealed a high willingness to pay, with an overall mean score of 3.3, categorized as "Very Willing." The data indicate that customers recognize the value of the CWD's efficient and high-quality septage management services.

This suggests that customers consider improved service quality and efficiency compelling reasons to financially support and participate in the mandated septage management services offered by the CWD. A positive attitude towards services is crucial in ensuring a customer-centric approach. Understanding and catering to the community's expectations and preferences is essential.

In this context, the willingness to pay is not merely a financial transaction but a strategic partnership between the water district and its customers. Both parties work together to achieve everyday environmental sustainability and public health goals. By recognizing and valuing the importance of efficient septage management services, customers contribute to the broader objectives of environmental conservation and community well-being. This mutual understanding and cooperation foster a collaborative relationship between the water district and its customers, ultimately leading to the successful implementation of septage management initiatives.

Moreover, the implications of these findings highlight an opportunity for Calamba Water District to leverage the customers' strong inclination to pay based on perceived value. By aligning their strategies with customer expectations and emphasizing the environmental and public health benefits, the CWD can foster continued support, contributing to the success and sustainability of their mandated septage management services. Pavia (2019) emphasized that perceived value was not solely based on the tangible benefits gained but also encompasses emotional, social, and environmental aspects. This aligned with the idea that customers' perceived value of septage management services extends beyond mere economic calculations. Factors such as improved community health reduced environmental pollution, and enhanced quality of life contribute to the comprehensive perceived value of these services.

In terms of Financial Capability

Table 7. Descriptive statistics of the customers' level of willingness to pay for the mandated septage management services in CWD in terms of financial capability

Indicators	Mean	Interpretation
As a customer, I will pay if the fee is reasonable.	3.38	Highly Willing
Overall Result	3.38	Highly Willing

As shown in Table 7, assessing customers' financial capability regarding their willingness to pay for Septage Management Services if the fee is reasonable revealed a high level of willingness, with an overall mean score of 3.38, categorized as "Very Willing." This suggests that customers are open to financial participation, provided the associated costs align with their perception of fairness and reasonableness.

This willingness to pay reflects a sense of civic responsibility and cooperation among customers, as they acknowledge their role in supporting essential public services that contribute to environmental and public health. Customers recognize the importance of investing in septage management services to ensure the proper treatment and disposal of wastewater, safeguarding the environment and public health.

Zvobgo (2021) emphasized that customers' ability to pay and perceived affordability significantly influenced their willingness to contribute financially to water supply services. These insights underscore the importance of considering customers' financial capacity and perceptions of affordability when designing pricing structures for essential services like septage management. Water districts can foster greater willingness to pay and enhance community support for vital environmental initiatives by ensuring that fees are reasonable and aligned with customers' expectations.

In Terms of Payment Preferences

Table 8. Descriptive statistics of the customers' level of willingness to pay for the mandated septage management services in CWD in terms of payment preferences

Indicators	Mean	Interpretation
1 As a customer, I am willing to pay the fee with the water bill.	3.24	Willing
2 As a customer, I am willing to pay for a one-time septic tank desludging service.	3.19	Willing
3 As a customer, I will pay P 60.00 to P 100.00 monthly for the Septic Tank Desludging/ Siphoning.	3.11	Willing
Overall Result	3.18	Willing

As shown in Table 8, assessing customers' payment preferences regarding their willingness to pay for Calamba Water District's (CWD) Mandated Septage Management Services revealed a positive attitude, with an overall mean score of 3.18, categorized as "Willing." The statement "As a customer, I am willing to pay a fee together with the water bill" yielded the highest mean of 3.24, indicating customer agreement. Conversely, Indicator 3, "As a customer, I am willing to pay ₱60.00 to ₱100.00 per month for the Septic Tank Desludging or Siphoning," yielded the lowest mean of 3.11, reflecting customer agreement.

These findings suggest that customers have a positive attitude towards paying for services, influenced by convenience and flexibility. Customers also exhibit varied preferences regarding payment structures, indicating their openness to different options. The preference for paying fees alongside the water bill is driven by the convenience of a consolidated payment method, simplifying the financial transaction for customers. Conversely, the preference for a one-time desludging service may indicate a desire for flexibility and control over individual service engagements. Lastly, the willingness to pay a specific monthly amount suggests that customers are open to making regular contributions, highlighting their commitment to supporting the service.

These findings underscore the importance of aligning pricing structures with customers' perceived value and affordability. Understanding customers' practical considerations is crucial in shaping payment preferences and willingness to pay for septage management services. As outlined in the FSSM plan (2019), strategies to encourage community participation include structuring the payment system to ensure affordability and ease of use. Water districts can enhance customer satisfaction and support for essential environmental initiatives by offering flexible payment options and ensuring pricing transparency.

3.3 Relationship Between Customers' Acceptance and Willingness to Pay

The statistical analysis revealed a significant relationship between customer acceptance and willingness to pay for the Calamba Water District's (CWD) mandated septage management service. As indicated in the table, all probability values were 0.000, which is less than the level of significance set at 0.05. Consequently, the null hypothesis was rejected.

This signifies a direct association between customers' acceptance of Septage Management Services and their willingness to pay. The positive and significant correlation coefficients for each pair of variables – Awareness and Understanding, Perceived Importance, Satisfaction with Service Quality, Compliance with Regulations, and Trust in the Water District—demonstrate that as customers' acceptance of mandated septage management services increases, their willingness to pay for these services also increases.

Table 9. Analysis of the relationship between customer's acceptance and willingness to pay for the CWD's septage management services

Customer's Acceptance Of Mandated Septage	Customers' Willingness To Pay	R-Value	P Value	Remarks	Decision
Awareness and Understanding	Perceived Value	0.465**	.000	Significant	Reject Ho
	Financial Capability	0.483**	.000	Significant	Reject Ho
	Payment Preferences	0.411**	.000	Significant	Reject Ho
Perceived Importance	Perceived Value	0.492**	.000	Significant	Reject Ho
	Financial Capability	0.502**	.000	Significant	Reject Ho
	Payment Preferences	0.387**	.000	Significant	Reject Ho
Satisfaction with Service Quality	Perceived Value	0.558**	.000	Significant	Reject Ho
	Financial Capability	0.535**	.000	Significant	Reject Ho
	Payment Preferences	0.513**	.000	Significant	Reject Ho
Compliance with Regulations	Perceived Value	0.549**	.000	Significant	Reject Ho
	Financial Capability	0.551**	.000	Significant	Reject Ho
	Payment Preferences	0.555**	.000	Significant	Reject Ho
Trust in Water District	Perceived Value	0.572**	.000	Significant	Reject Ho
	Financial Capability	0.476**	.000	Significant	Reject Ho
	Payment Preferences	0.515**	.000	Significant	Reject Ho

*Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

The study results hold significant implications for the Calamba Water District, emphasizing the critical link between Customer Acceptance and Willingness to Pay. To encourage greater financial participation, the district must prioritize customer education, improve communication, build stronger relationships, and enhance technical service delivery aspects. Strengthening awareness campaigns and emphasizing the significance of septage management services are crucial steps, as well as ensuring high-quality service and fostering trust through transparent communication. These components are integral to a comprehensive strategy that ensures sustainable support and engagement.

Furthermore, understanding Payment Preferences highlights the importance of aligning payment structures with customer preferences to boost satisfaction and willingness to contribute financially. The intricate relationship between customer acceptance and willingness to pay should guide the development of comprehensive strategies for sustainable support and engagement in the Calamba Water District's mandated septage management services.

In their recent study, García-López et al. (2021) shed light on the relationship between economic considerations and decision-making regarding environmental services. They found that customers weigh the costs and benefits of these services, impacting their willingness to pay. Similarly, Mensah et al. (2020) revealed that income, education, and perceived benefits influence the willingness to pay for sanitation services. Eridadi et al. (2021) also found that households are willing to pay more for improved water supply services, but affordability remains a challenge, particularly for low-income households. These studies underscore the importance of addressing economic considerations and perceived benefits to enhance customer participation and support for essential environmental initiatives.

3.4 Proposed Action

The proposed plan aims to enhance customers' awareness of the importance of Septage Management, ultimately seeking to foster a more informed, engaged, and accepting community.

Table 10. Proposed action plan

Key Areas	Objective	Strategies/Activities	Frequency	Persons Involved	Success Indicators
Awareness And Understanding	To raise awareness among customers about the importance of proper household septic tank maintenance	Organize community workshops or seminars to educate residents about the importance of periodic cleaning and maintenance of septic tanks.	Q1 - Q2	Commercial Department Manager/ Public Information Committee/ Septage Management Committee	85 % of the customers are adhering to the recommended desludging schedules 10% decrease in non-compliance penalties
Compliance With Regulations	To reinforce compliance with existing regulations and ordinances related to septage management.	Implement a targeted regulatory awareness campaign by distributing informational pamphlets and increasing clarity on penalties through signage and online platforms. Conduct regular compliance audits and joint inspections.			
Perceived Importance	To increase awareness about the role of sewage management in preventing waterborne diseases and pollution among customers.	Partner with the LGU, City Health Office, and NGOs to raise community awareness regarding proper septage management to prevent waterborne diseases and protect water sources from pollution.	Whole year round	Public Information Committee	90% community acceptance rate of the Septage Management Services. Increase community involvement in environmental and sanitation practices
Satisfaction With Service Quality	To improve the quality and efficiency of septage management services and increase customer satisfaction with CWD's services.	Implement a comprehensive program for assessing and improving septage management processes to ensure high service quality.	Whole year round	Operations Department Manager	95% of customers satisfaction with the overall service quality. 10% reduction in the complaints received from customers Successful implementation of technological upgrades and equipment enhancements Improved Processes
Trust In Terms Of Water District	To strengthen trust in CWD's commitment to managing poor sanitation by properly implementing Septage Management Services.	Provide information on how SMS services contribute to environmental sustainability and public health. Explore collaborations with NGOs and implement Corporate Social Responsibility initiatives related to sanitation and public health. Keep the customers 'informed about the progress of sanitation initiatives	Whole year round	Management, Commercial Department Manager / Public Information Committee	95% positive feedback from community engagement programs 10% increase in trust scores from customer surveys Successful collaborations with NGOs
Perceived Value, Financial Capability And Payment Preferences	To increase customers 'willingness to avail themselves of and pay for Septage Management Services.	Implement a payment structure that suits the customer's preferences. The septage fee should not exceed 5% of the Low-Income Group	Whole year round	Management, Finance and Commercial Manager	90% collection efficiency 10% reduction on the customers' late payment

4.0 Conclusion

Based on the findings, the following conclusions were drawn:

Customers must comprehensively understand the regulatory framework governing wastewater management. They also recognize the importance of Septage Management and its potential environmental and public health contributions. The positive perceptions of the customers towards the Mandated Septage Management indicate their acceptance of the service, which is based on their trust in the ability of the Calamba Water District (CWD) to provide high-quality and accessible services. Additionally, customers recognize the value of efficient and high-quality Septage Management Services. The results suggest that customers consider improved service quality and efficiency compelling reasons to financially support and participate in CWD's mandated septage management services. Additionally, the results show that customers have different payment preferences, which means pricing structures should align with customers' preferences and affordability. Moreover, the positive and significant correlations suggest that customers' acceptance is closely associated with the customers' willingness to pay for the CWD's Mandated Septage Management Services. Therefore, the proposed action plan is necessary to enhance customers' acceptance of Septage Management and willingness to pay. This can be achieved by creating an effective communication strategy that focuses on the service's positive aspects, highlighting its significance, benefits to the community, and contributions to environmental and public health.

Based on the above conclusions, suggestions and recommendations are provided. First, although there is already high awareness and understanding of the importance of Mandated Septage Management Services, ongoing educational campaigns may help further inform customers and non-customers of the Calamba Water District (CWD) about the significance of these services. It is important to encourage open dialogue between the CWD and the community to address any questions or concerns and to maintain transparent communication about the agency's activities, achievements, and plans related to percentage management. The quality of Septage Management Services should be regularly assessed and enhanced to meet or exceed customer expectations. Customers may also be made fully aware of the regulatory frameworks governing wastewater management to ensure that they understand their roles and responsibilities. Finally, the CWD may continue to build and reinforce trust through consistent, reliable, and high-quality service delivery.

Additionally, Effective Septage Management Services require a clear and effective communication plan with customers. By presenting a transparent pricing structure and outlining the benefits of the service, customers will be more likely to engage with the service. Various payment options may be offered to cater to customers' diverse preferences. Regular assessments may be conducted to ensure that the pricing structures remain affordable. Engaging the community in discussions about pricing structures and gathering their input on preferred payment options will help create a service that is effective and affordable for everyone.

Moreover, to increase customer acceptance and willingness to pay, the Calamba Water District should take targeted actions to improve customer perceptions. This may be achieved through educational campaigns, workshops, and communication strategies that emphasize the importance and benefits of their septage management services. The Water District will likely see increased support and financial contributions by building a positive image and understanding among customers.

Furthermore, the proposed action plan may focus on collaboration and adaptability. It is essential to regularly review progress, collect customer feedback, and adjust strategies accordingly. Engaging cross-functional teams, including the Commercial Department, Operations, Public Information Committee, and Septage Management Committee, will ensure a comprehensive and coordinated approach. Continuous evaluation through key performance indicators will guide adjustments to the plan, ensuring its effectiveness in creating an informed, engaged, and accepting community for mandated septage management services in the Calamba Water District.

Lastly, further research is necessary to understand how promoting community ownership and shared responsibility can positively influence customers' acceptance and willingness to pay for septage management services. Additionally, exploring advancements in wastewater treatment can aid in achieving sustainable development goals by promoting responsible waste management practices, preserving resources, and mitigating the impact of human activities on the environment.

5.0 Contributions of Authors

The sole author conceptualized and implemented the study.

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7.0 Conflict of Interests

The author declares no conflicts of interest about the publication of this paper.

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