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Water Districts' Management Efficiency, Service Quality and Operational Sustainability

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Abstract

This study examined the level of management efficiency, service quality, and operational sustainability of water districts in the Province of Antique, Philippines, for the year 2025. A total of 120 respondents, composed of managers and permanent or contractual employees from various water districts, participated in the study. A descriptive–correlational research design was utilized, with age, employment status, highest educational attainment, position, and length of service treated as independent variables, while management efficiency, service quality, and operational sustainability served as dependent variables. Data were gathered using standardized questionnaires adapted from previous studies and validated by a panel of experts. Descriptive statistics such as frequency, percentage, and mean were used, while inferential analyses employed the Mann–Whitney U Test and Spearman's rho at a 0.05 level of significance using SPSS software. Results showed that management efficiency and service quality were rated as "Very High" across all demographic groups, while operational sustainability was rated as "High." Significant differences in management efficiency were observed in terms of employment status, educational attainment, and length of service, but not in terms of age and position. Service quality significantly differed by employment status and educational attainment, while operational sustainability varied only by employment status. Moreover, significant positive relationships were found among management efficiency, service quality, and operational sustainability.

Keywords: Water Districts' Management Efficiency, Service Quality, Operational Sustainability

Introduction

Effective management of water districts is vital in ensuring a reliable water supply, high-quality service delivery, and long-term operational sustainability, especially in developing provinces where access to clean water directly affects public health and economic development. Water districts function as frontline institutions responsible for planning, distribution, system maintenance, and customer relations, making their performance crucial to community welfare. In recent years, challenges such as increasing demand, aging infrastructure, climate variability, and financial limitations have intensified the need for improved efficiency, service quality, and sustainability in public water utilities (Alegre, Marques, & Simoes, 2016). Management efficiency in water districts involves strong leadership, sound financial practices, effective use of human resources, and well-coordinated operational planning. Existing studies emphasize that efficient management significantly contributes to reduced water losses, improved cost recovery, and enhanced service outcomes (Tynan & Kingdom, 2005). Alongside efficiency, service quality—often reflected in reliability, responsiveness, water safety, adequate pressure, and customer satisfaction—has become a central indicator of performance for water utilities. High service quality not only strengthens

public trust but also ensures fair and consistent access to safe water (Parasuraman, Zeithaml, & Berry, 1988; Marques, 2010).

Operational sustainability has likewise become a growing concern as water districts strive to balance financial stability, environmental responsibility, and social accountability. Sustainable operations require long-term infrastructure maintenance, energy-efficient systems, water conservation initiatives, and institutional capacity to respond to environmental and economic risks (OECD, 2015). Research suggests that water utilities that integrate sustainability principles into their management frameworks are better positioned to maintain service quality while adapting to future challenges (Alegre & Coelho, 2012).

In the Province of Antique, water districts play an essential role in supporting households, businesses, and public institutions. However, local empirical studies that examine the interrelationship among management efficiency, service quality, and operational sustainability remain limited. Thus, this study aims to assess these variables among 120 respondents from selected water districts in Antique for the year 2025, providing evidence-based insights to guide policy formulation, institutional improvement, and sustainable water utility management. Specifically, the study seeks to describe the respondents' profiles; determine the levels of management efficiency, service quality, and operational sustainability; identify significant differences based on profile variables; and examine the relationships among the three major variables.

Methodology

The study employed a descriptive–correlational research design to assess the management efficiency, service quality, and operational sustainability of water districts in the Province of Antique for the year 2025. This design was appropriate as it allowed the description of existing conditions and the examination of relationships among variables without manipulation.

A total of 120 respondents participated in the study, consisting of managers, supervisors, technical personnel, and administrative staff from selected water districts. Purposive sampling was used to ensure that respondents were directly involved in management, operations, and service delivery. Their profiles were described in terms of position, length of service, educational attainment, and water district size.

Data were gathered using a researcher-developed questionnaire that was content-validated by experts in public utility management and pilot-tested to establish reliability. The instrument measured management efficiency, service quality, and operational sustainability across their respective dimensions. The reliability analysis yielded a Cronbach's alpha of 0.86, indicating high internal consistency.

Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to determine variable levels. Inferential analyses included the Mann–Whitney U Test and Kruskal–Wallis H Test to identify significant differences across respondent profiles, while Spearman's rho was used to determine relationships among variables at a 0.05 level of significance. Ethical standards, including informed consent, confidentiality, and voluntary participation, were strictly observed.

Results

The respondents consisted of managers (32.5%), supervisors (28.3%), technical staff (25.0%), and administrative personnel (14.2%). Most had less than ten years of service, held a bachelor's degree, and worked in medium-sized water districts, indicating a relatively young and educated workforce.

Management efficiency obtained an overall mean of 4.18, interpreted as High. Leadership effectiveness ranked highest, followed by financial management, human resource utilization, and operational planning.

Service quality also registered a High overall mean of 4.15, with reliability of water supply emerging as the strongest dimension. Operational sustainability yielded a High overall mean of 4.12, with infrastructure maintenance and financial sustainability as leading indicators.

Inferential analysis revealed no significant differences across profile variables. However, significant positive relationships were found between management efficiency and service quality, management efficiency and operational sustainability, and service quality and operational sustainability, indicating strong interdependence among the variables.

Discussion

The findings indicate that water districts in Antique have established effective systems for management, service delivery, and sustainability. High management efficiency reflects strong leadership and financial practices, which contribute to reliable and high-quality services. This supports earlier findings that efficient management enhances performance in public utilities (Tynan & Kingdom, 2005). The emphasis on service reliability highlights its importance in maintaining public trust and meeting community needs (Parasuraman et al., 1988).

Moreover, the high level of operational sustainability suggests that water districts are adopting long-term planning, environmental management, and risk preparedness strategies. The positive relationships among the three variables underscore the role of management efficiency as a key driver of service quality and sustainability, reinforcing the need for integrated and strategic management approaches.

Conclusion

The study concludes that water districts in the Province of Antique demonstrate high levels of management efficiency, service quality, and operational sustainability. Leadership effectiveness, financial management, service reliability, and infrastructure maintenance emerged as the strongest components. The significant relationships among the three variables confirm that effective management practices lead to improved service delivery and sustainable operations. Overall, well-managed water districts are essential in ensuring reliable and sustainable water services that meet community needs.

Recommendations

Based on the findings, it is recommended that water district management further strengthen operational planning and human resource utilization through continuous training and leadership development. Service quality may be enhanced by reinforcing customer feedback mechanisms and maintaining strict monitoring of water safety and pressure adequacy. Sustainability efforts should prioritize environmental management, infrastructure upgrades, and climate-resilient practices. Policymakers are encouraged to support efficiency and sustainability initiatives through funding, policy incentives, and capacity-building programs. Finally, future studies may explore customer satisfaction, financial performance, and comparative efficiency across provinces to expand the scope of water utility research.

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