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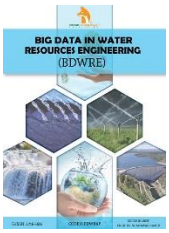

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RESEARCH ARTICLE

WATER FACILITY SERVICE MANAGEMENT OF WATER SUPPLY PROVIDERS (WSPS) IN LAGUNA, PHILIPPINES: A STATUS REPORT

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ABSTRACT

This study explores the water facility service management of Water Supply Providers (WSPs) in Laguna, Philippines in terms of water accessibility to potable water, water reliability, and water adequacy to meet the Local Water Utilities Administration's (LWUA) performance standards. The study employed a quantitative research method. A gap analysis was the statistical treatment applied. A total of eleven (11) water supply providers in Laguna were the participants in the study. Findings show that water is not accessible, the water supply is not reliable, and the water is barely adequate to meet concessionaires' demands. The recommendation includes the following: WSPs must conduct a comprehensive assessment of their current operations and prioritize improving their management of water facility service. WSPs must address substantial gaps in their performance as identified in water accessibility to potable water, water reliability for 24/7 water supply and 10 pounds per square inch (psi) water pressure, and water adequacy to meet the water demand of concessioners.

KEYWORDS

Water Accessibility, Water Reliability, Water Adequacy, Performance Standards

1. INTRODUCTION

Water is vital for human health and survival, and access to water is recognized as a human right. For protecting the population's health, well-being, and productivity in cities and rural areas, reliable and vast water supply systems are essential for their functioning. The systems consist of vast underground networks with delicate and complex arteries requiring care and daily operations by professional people. Some water service providers have responsibilities and functions involving extraction from remote sites, purification, conveyance, distribution, waste treatment, sewerage, and pipe network operations (Jain et al., 2017; Kumar et al., 2023).

A Water Service Provider (WSP) is a local corporate entity that operates and maintains a water supply system in one or more provincial cities or municipalities. The WSP is an autonomous, independent, self-sustaining, and non-stock, non-profit quasi-public corporation that is a private corporation discharging public duties. It receives no financial support from the government- either local or national, nor has it received any allotment from taxes collected by the government. It relies merely on its funds for its day-to-day operations and depends on loans for its major expansion projects. WSP is tasked to contribute to improving the quality of life of the people in the community by providing adequate, potable, and affordable water supply in their area of jurisdiction while remaining financially viable and self-reliant.

This study aims to delve into the water facility service management of Water Supply Providers (WSPs) in Laguna, Philippines, regarding water accessibility to potable water, water reliability, and water adequacy to meet the Local Water Utilities Administration's (LWUA) performance standards.

2. LITERATURE REVIEW

Water constraint is a global problem that afflicts both developing and developed countries. More than a fourth, 2.1 out of 7.5 billion people worldwide still lack safely managed drinking water. This water shortage results from rapid population growth and poor governance, which led to the failure to implement the necessary water supply infrastructure and systems to meet the growing demand for water for a rapidly increasing population. In the Philippines, 9 million out of 101 million Filipinos still suffer from unimproved, unsafe, and unsustainable water sources. Inadequate and intermittent water supply afflicts rural areas, low-income urban cities, and even the foremost urban center, Metro Manila (Tan, 2020).

Due to the severe problems experienced by the public in the availability of safe drinking water in Mexico, the public water management system has been criticized, with significant differences between the regions regarding water system distribution and the availability of renewable water (Valencia et al., 2023). Inefficiency in water governance exists in the country attributed to the lack of transparency in policies for water supply services. The efficiency of the country's water management system was evaluated in terms of efficiency, efficiency improvement, and the relationship of efficiency on population size and renewable water availability in each state. The study's findings revealed a high average efficiency of the water management system. However, water system improvements were found to be very low in efficiency. An increase in the

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use of techniques for water availability can improve the water management system, coupled with the reduction of water demand, which can be facilitated through capital investment and long-term planning.

Imperative to the development of a city is the water supply of the metropolitan area; thus, water supply utilities' main goal is ensuring water availability to eliminate health, political, and social problems (Sarfaraz et al., 2023, Kumar et al., 2023). There is a need to ensure that facilities and equipment for water supply are in good condition, plans for efficient preventive maintenance are developed, and the maintenance team's performance is effectively monitored. Using different Data Development Analysis models, the study investigated the efficiency indices of Tehran's water utility maintenance units (Kumar et al., 2009). The study introduced the use of performance assessment metrics of repair time efficiency and availability efficiency. The study's findings show the importance of developing the functions of performance monitoring of maintenance and repair departments for the provision of efficient and effective systems for repair and maintenance. The functions include the preparation of the equipment for repair, identification of the equipment's weaknesses, and the design of a plan to improve the performance of the equipment.

Water service providers need to maintain reliability and continuity of water supply, involving the provision of consistent water availability to meet consumer needs. This function involves assessing factors such as fluctuations in water pressure, duration and frequency of water outages, and response time for repairing the water network. A reliable water supply is vital for domestic, industrial, and commercial purposes. Most public water utilities in developing countries face several challenges in improving service quality delivery. These challenges are linked to infrastructural, financial, environmental and health, social-political and managerial (Gowela et al., 2017).

A key tool in the promotion and achievement of performance improvement is the measurement of the efficiency of the water industry utilities by identifying the factors affecting it (Storto, 2022). The proper measurement of the efficiency of the utility requires considering the variables affecting the efficiency score, which, when not considered, can lead to an unrealistic measurement of the performance of water utility. The local government is responsible for supporting investments in mitigating the infrastructure through increased capacity and service quality improvement. Attaining the goals of water services delivery requires identifying the kind of good water supply and looking for the best framework for its economic provision (Velasco et al., 2020). Water is considered a complex common resource, resulting in overconsumption if unregulated.

The national government supports the local government units (LGUs) in providing water services, cognizant of LGUs' challenges and the fact that those households have no access to safe water, thus closing the gap in infrastructure in water services. The programs used by LGUs are performance-based, combining performance and equity-based programs. The study's findings show the need for streamlining and aligning technical and economic regulations and standards for operations. Improved investment coordination is required within the sector to ensure strategic and efficient investments. The provision of the services also needs complete and consolidated data from providers and key performance indicators, which are needed for effective monitoring. Duplicative efforts and delayed investments must be avoided through the hurdling of political economy issues. The study provides policymakers with information on the different modes of providing local water services through awareness of the recent government programs for improving access to water supply and developing future interventions that strengthen the decentralization of the services and in responding to crises.

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Water service providers need to maintain reliability and continuity of water supply, involving the provision of consistent water availability to meet consumer needs. This function involves assessing factors such as fluctuations in water pressure, duration and frequency of water outages, and response time for repairing the water network. A reliable water supply is vital for domestic, industrial, and commercial purposes. Water districts are responsible for maintaining, upgrading, and repairing water infrastructure, including distribution pipelines, treatment plants, storage facilities, and pumping stations. Their performance is evaluated based on the condition of the infrastructure, investments, and frequency of repairs, ensuring efficient operation and long-term sustainability.

Serving as the national action plan to achieve universal access to sufficient, affordable, safe, and sustainable water supply, sanitation, and hygiene by 2030 is the Philippine Water Supply and Sanitation Master Plan (PWSSMP) (NEDA, 2017). It is grounded in the needs of every region and linked to the targets of the national water supply and sanitation (WSS). Responsible agencies, activities, and the essential budget are defined by the PWSSMP, supporting the WSS sector in addressing the country's needs. Environmental, economic, proposed policies and engineering solutions match the requirements of the regions, recognizing that the conditions and challenges vary in every community.

As the gap between water supply availability and demand widens in the Philippines, certain areas experience water scarcity and stress. If the sector does not improve, the water crisis will worsen by 2040, with 12.4 million people getting water from unsafe sources (NEDA, 2021). Most water service providers (WSPs) are not technically and financially capable of delivering the required water services to the country's growing population, so certain areas will not have water services.

The Local Water Utilities Administration (LWUA) is a significant oversight agency for the provision of water supply, specializing in developing, promoting, and financing local water utilities as mandated in PD 768; Section 22 (Velasco et al., 2018). LWUA prescribes regulations and standards for assuring acceptable construction supplies and materials standards, personnel training, operation, fiscal, and accounting practices for local water utilities. It furnishes personnel training programs and technical assistance for local water utilities and evaluates and monitors water standards.

Attainment of one hundred percent (100%) access to potable water by 2030 is the sector's current implementation and regulatory framework for the local water service. Causing the inefficiency of government interventions and programs and the failure to address the shortcomings of the water service sector is the inability to assess the success of the provision efforts for water service.

Lack of coordination was seen due to the fragmented water sector and the overlap in the oversight agencies' mandates. This results in duplicative and uneven investments in the public sector. The study recommends streamlining and delineating the water sector's regulations. This will ensure the uniformity of principles, rules, and standards in the sector's governance. Streamlining regulations enables the government to hone its regulatory knowledge and apply uniform rules at the national level. Water rate-setting formulas can be harmonized to ensure that consumers benefit from operating efficiency.

There is a need to align technical regulations with the standards of operations. Harmonization of the operating standards and technical regulations is required for a unified view of the efficiency level expected by consumers. Using uniform objectives, funding allocation can be implemented quickly. As the national government discontinues its support programs, LGUs must spend on water supply services, which require the identification of bottlenecks, strengthening of investment planning, and formulating solutions to the delayed utilization of the local development fund.

With the governance structure in place among local water districts, transparency, independence, and accountability are promoted with an effective regulatory framework establishing clear standards and guidelines for water service operations (Kumar, 2009; NEDA, 2021).

The Philippine government welcomes private sector participation, joining the public sector in addressing the challenges faced in providing water services for the people, which is considered a particularly formidable task. Government regulations include the promotion of the best interests of customers and ensuring fair treatment of Water Service Providers (WSPs); achieving services for water supply and sanitation; development of a financially sustainable and efficient system; provision of coverage with

services that people are willing and want to pay; and allowing a range of methods for the provision of water services.

The theoretical framework accounted for in this research is the International Water Association (IWA) Benchmarking Process. The benchmarking model developed by the International Water Association (IWA) is a framework that aims to support water and wastewater utilities in assessing their performance and identifying areas for improvement. This model, known as the IWA Benchmarking Framework, provides a structured approach to compare and evaluate the performance of utilities based on key performance indicators (KPIs) and best practices (IWA, 2016).

The framework uses a set of performance indicators to measure and assess the performance of water and wastewater utilities. These indicators cover various aspects of utility operations, including service quality, operational efficiency, financial management, customer satisfaction, and environmental sustainability. Performance indicators may include water loss percentage, energy consumption per unit of water produced, customer complaint resolution time, and revenue collection efficiency.

This study explores the water facility service management of Water Supply Providers (WSPs) in Laguna, Philippines, regarding water accessibility to potable water, water reliability, and water adequacy to meet the Local Water Utilities Administration's (LWUA) performance standards.

3. METHODS

The study adopted a descriptive research design to describe the characteristics of the sample and the area of interest, discover new meaning, describe the aspects of the situation as it naturally occurs, and discover relationships among selected variables. Thus, it accurately and systematically provided the answers to questions according to ongoing events of the present. The study was conducted in service areas of the select water service providers (WSPs) within Laguna Province. The research population includes all WSPs under LWUA in the Province of Laguna. An alphanumeric coding system was used for this study, WSP1 up to WSP11, which represents the various water service providers operating within the Province of Laguna to preserve the anonymity and confidentiality of the WSP participants.

WSP stands for water service provider, and the immediately succeeding number denotes the area of operation of the WSP. The service coverage of a WSP is either a municipality or city. In some cases, the WSPs' area of jurisdiction covers not only one municipality or city but can expand to other contiguous areas. The water service provider1 (WSP1) of a service area is a local water district classified as a government corporation formed by the local government for the operation and maintenance of the water supply and wastewater management system, which has been issued a certificate of conformance by the Local Water Utilities Administration (LWUA). On the other hand, LWUA is a government agency that provides financial, technical, and institutional support to local water districts nationwide.

The research data are secondary, specifically the WSPs' Annual Accomplishment Report. Secondary data consisted of performance indicators prescribed by the Local Water Utilities Administration (LWUA) for WSPs' water facility service management performances. The Annual Accomplishment Report serves as one of the requirements for granting a Performance Base Bonus for WSPs (LWUA and DBM, 2020). The existing datasets were taken from the records, databases, and websites of water service providers, LWUA, and the Commission on Audit. Gap analysis is the statistical method applied to the data gathered to describe the relationships between the study's variables and draw meaning from the data set.

4. THE DATA ANALYSIS

This section offers the performance gaps in WSPs' existing practices using the performance indicators prescribed by the Local Water Utilities Administration (LWUA) in terms of the Water Facility Service Management Key Performance Area (KPA).

Table 1: Performance Gaps in Water Facility Service Management in terms of KPI 1 – Access to Potable Water

WSP	KPI 1-Access to Portable Water Target :100%	
	Accomplishment	Gap
WSP 1	57%	43%
WSP 2	27%	73%
WSP 3	64%	36%
WSP 4	62%	38%
WSP 5	34%	66%
WSP 6	82%	18%
WSP 7	42%	58%
WSP 8	99%	1%
WSP 9	43%	57%
WSP 10	69%	31%
WSP 11	96%	4%

For KPI 1 on access to potable water, which measures the percentage of households with access to potable water against the total number of families within the coverage of the WSP, WSP 8 and WSP 11 with gaps of 1% and 4%, respectively, almost achieved the target. The performance gaps of the rest of the WSPs range from 31% to 73%, indicating a significant gap between the target of 100% and the actual accomplishment. The performance gap implies the inability of the majority of the water service providers to provide accessibility of potable water to the households, which can be attributed to insufficient infrastructure, such as water distribution lines essential in the delivery of potable water within the service areas. Water service providers could have struggled to expand and extend their water distribution pipeline network in areas where the WSPs service is unavailable.

Table 2: Performance Gaps in Water Facility Service Management in terms of KPI 2 –Water Reliability for a 24/7 Supply

WSP	KPI 2-Water Reliability – 24/7 Supply Target :100%	
	Accomplishment	Gap
WSP 1	90%	10%
WSP 2	100%	0%
WSP 3	99%	1%
WSP 4	98%	2%

Table 2 (Cont.): Performance Gaps in Water Facility Service Management in terms of KPI 2 –Water Reliability for a 24/7 Supply		
WSP 5	100%	0%
WSP 6	98%	2%
WSP 7	98%	2%
WSP 8	90%	10%
WSP 9	95%	5%
WSP 10	90%	10%
WSP 11	99%	1%

KPI 2 on water reliability for 24/7 supply measures the percentage of household connections receiving a 24/7 water supply. Findings show that only WSPs 2 and 5 could comply with the key performance indicator target of 100%, while the performance gaps of the remaining WSPs range from 1% to 10%. The slight performance gap in water service shows the providers' inability to prioritize water storage, asset management, upgrades, maintenance, and the conduct of repairs of the water system facilities to ensure the availability of reliable and safe water supply 24 hours a day. Likewise, WSPs could have failed in the planning for water scarcity, climate change, or natural disasters that have prepared them for responding to disruptions and maintaining the continuity of water service.

Table 3: Performance Gaps in Water Facility Service Management in terms of KPI 3 –Water Reliability for 10 psi and above pressure		
WSP	**KPI 3- Water Reliability – 10 psi and above preassure Target :100%**	
	Accomplishment	**Gap**
WSP 1	70%	30%
WSP 2	90%	10%
WSP 3	95%	5%
WSP 4	95%	5%
WSP 5	50%	50%
WSP 6	96%	4%
WSP 7	98%	2%
WSP 8	90%	10%
WSP 9	92%	8%
WSP 10	80%	20%
WSP 11	100%	0%

For KPI 3, which measures the percentage of household connections with ten (10) psi and above water pressure, only WSP 11 had a 0% gap. WSPs 3,4,6,7, and 9 had a performance gap with a range of 2% to 8%, while the rest had 10% to 50% performance gaps. The finding shows the inability of most of the WSPs to provide and maintain adequate water pressure, specifically during peak usage periods, which can be exacerbated in locations with seasonal water demand fluctuations or where the water demand is high. Insufficient infrastructure can cause the service providers to fail to maintain adequate pressure throughout the system for water distribution, which can lead to insufficient pressure and pressure drops at the end of the water distribution system. The high-performance gap in several WSPs failing to maintain the required water pressure can indicate undersized pipelines and pump facilities and the presence of leakage in the water distribution system.

Table 4: Performance Gaps in Water Facility Service Management in terms of KPI 4 – Water Adequacy		
WSP	**KPI 4- Water Adequacy Target :150%**	
	Accomplishment	**Gap**
WSP 1	146%	4%
WSP 2	113%	37%
WSP 3	246%	0%
WSP 4	201%	0%
WSP 5	160%	0%
WSP 6	100%	50%
WSP 7	90%	60%
WSP 8	65%	85%
WSP 9	100%	50%
WSP 10	90%	60%
WSP 11	223%	0%

KPI 4 measures the source capacity of the WSP to meet the demand for a 24/7 water supply. The formula set by LWUA in computing adequacy is the rated capacity of sources in cubic meters per year divided by the demand in cubic meters per year. The demand is computed as the number of active connections multiplied by five (5), which is the average household size multiplied by the range of 100 to 130 liters per capita per day multiplied by 365 days, then multiplied by one cubic meter per 1000 liter. Only WSPs 3,4, 5, and 11 achieved the 150% target. WSP 1 almost hit the target with a performance gap of 4%. However, most WSPs failed to meet the target, with performance gaps ranging from 37% to 85%. The

gap in water adequacy implies the failure of most of the service providers to provide adequate infrastructure, such as additional water sources, to meet the water demand of households, especially at times of water scarcity brought about by climate change, natural disasters, and water disruptions during facility maintenance and repair. The water demand in urban locations with density populations could have increased with population growth, making water service providers struggle to keep the water demand, aside from water loss through leaks that can further lead to the reduced amount of available water to meet the demand.

Findings insinuate that performance gaps indicate a need for significant improvements in the practices of most WSPs in terms of Water Facility Service Management KPA. The researcher recommends that the WSPs with substantial gaps in their performance take appropriate measures to improve their practices in these areas, such as increasing their source capacity, upgrading their infrastructure, and improving their operational efficiency. WSPs should also regularly monitor and evaluate the Water Facility Service KPIs to identify and address performance gaps.

5. Conclusion and Recommendation

The performance of the WSPs varies widely across the KPIs, manifesting that each WSP has unique or distinctive characteristics that set them apart from others in terms of water facility service management. Substantial performance gaps have been identified in the existing operations of WSPs regarding water accessibility and reliability for 24/7 water supply, including water adequacy. Recognizing the gap between actual and standard performance can guide the WSPs to make informed decisions, allocate resources more efficiently, evaluate performance, and improve customer satisfaction.

WSPs may conduct a comprehensive assessment of their current operations and prioritize improving their management of water facility service, particularly in addressing substantial gaps identified in water accessibility. The evaluation requires significant improvements in the management of water facility service by the WSPs to meet the LWUA-prescribed standards and achieve the highest level of concessionaire satisfaction.

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