

## GOVERNING URBAN WATER IN A DECENTRALIZED SYSTEM: INSTITUTIONS, INCENTIVES, AND UTILITY PERFORMANCE ACROSS CITIES IN THE ZAMBOANGA PENINSULA, PHILIPPINES

<sup>1</sup>Alex R. Marcos, DPA

<sup>1</sup>Western Mindanao State University

### ABSTRACT

*Urban water provision sits at the intersection of public administration, infrastructure policy, and social equity. In the Philippines, high aggregate access to drinking water coexists with uneven service reliability, coverage gaps, and persistent inefficiency—patterns that point to governance constraints rather than hydrological scarcity alone. This study examines how institutional structures and incentive systems shape urban water governance outcomes across five cities in the Zamboanga Peninsula (Region IX): Zamboanga City, Pagadian City, Dipolog City, Dapitan City, and Isabela City. The analysis applies a multi-level governance and institutional-incentive framework to trace how authority, resources, and accountability are distributed among national regulators and sector agencies (notably the National Water Resources Board and the Local Water Utilities Administration), local government units, and city water providers. The study adopts a comparative case design using publicly verifiable secondary data from 2022–2024, including utility performance reports and administrative records on service delivery and operational efficiency. Key indicators include service coverage, continuity of supply, and non-revenue water, alongside governance features such as tariff-setting influence, access to national financing, technical capacity, and the presence of cross-agency coordination mechanisms. Findings show persistent intra-regional disparities under a common national legal framework. Zamboanga City reports the highest coverage and continuity, but also the highest system losses, while smaller systems demonstrate lower coverage and more intermittent supply with only marginally better efficiency. Across cases, outcomes align less with formal decentralization than with fragmented mandates, weak regulatory enforcement, politically constrained tariff governance, and limited performance-linked funding—conditions that weaken accountability and dilute responsibility for results. The study proposes reforms focused on (1) tighter regulatory and planning coordination across levels, (2) performance-conditioned financing tied to measurable service and efficiency targets, and (3) transparent, insulated tariff review with structured stakeholder engagement to improve equity, reliability, and sustainability in regional urban water services.*

Keywords: *Urban Water Governance, Public Administration, Infrastructure Policy, Social Equity, Zamboanga Peninsula Philippines*

### 1. INTRODUCTION

Urban water provision stands at the intersection of public administration, infrastructure policy, and social equity. Cities depend on reliable water services to sustain public health, economic activity, and urban growth. Yet governance failures continue to shape uneven outcomes across many developing and middle-income countries. The Philippines presents a compelling case. Despite high aggregate access to basic drinking water, service quality, reliability, and safety vary across regions and cities (Ulep et al. 2024). These disparities reflect governance arrangements rather than hydrological scarcity alone.

The Zamboanga Peninsula, officially designated as Region IX, illustrates the challenges of decentralized water governance. The region includes a mix of highly urbanized and component cities that operate under distinct institutional arrangements. Zamboanga City, the region's economic center, manages one of the largest water districts in Mindanao, while Pagadian, Dipolog, Dapitan, and Isabela City rely on smaller systems with constrained fiscal and technical capacity. Across these cities, water districts function as local public utilities under the supervision of the Local Water Utilities Administration (LWUA), while water resource regulation remains vested in the National Water Resources Board (NWRB). Local governments exercise varying degrees of oversight and political influence over utility

management.

This institutional landscape raises core public policy questions. How do institutional structures and incentive systems shape water governance outcomes in decentralized urban settings? Why do cities within the same region display persistent differences in service coverage and system performance? What policy levers exist to improve accountability and coordination across governance levels?

This article addresses these questions through a multi-level analysis of urban water governance in the Zamboanga Peninsula. It argues that governance outcomes depend less on formal decentralization and more on how institutions allocate authority, structure incentives, and constrain administrative behavior. Fragmented mandates and misaligned incentives weaken service delivery, even when legal frameworks assign responsibility to local actors.

The contribution of this study is threefold. First, it extends public administration theory on decentralization by examining utility governance rather than general service provision. Second, it provides empirical analysis from an understudied region in Southeast Asia, grounded in official administrative data. Third, it offers policy-relevant insights for national and local reform in the Philippine water sector.

The article proceeds as follows. The remainder of Part I develops the theoretical framework and reviews relevant literature on institutions, incentives, and urban water governance. Subsequent sections examine the Philippine policy context, data and methods, empirical findings, and policy implications.

## **1.1 Theory and Literature Review**

Urban water governance research emphasizes the interplay of institutional structures, incentives, and multi-level coordination in shaping service delivery outcomes. Institutional theory posits that formal rules, mandates, and organizational hierarchies determine actor behavior, creating pathways or barriers for effective policy implementation (Blanco, 2019). Polycentric and multi-level governance frameworks highlight the importance of nested authorities and cross-sector collaboration to manage complex resources, such as urban water systems (Rola et al., 2016).

Empirical studies in the Philippines demonstrate that fragmented mandates across national regulators, local government units (LGUs), and water utilities produce inconsistencies in access, service reliability, and infrastructure development (Rola et al., 2015). Incentive misalignment further constrains operational efficiency, as actors prioritize divergent objectives, including revenue generation, local development, and regulatory compliance. This body of literature informs the present study by linking governance structures, incentive mechanisms, and coordination practices to water access disparities and service outcomes in the Zamboanga Peninsula.

### **1.1.1 Institutions and Public Policy Outcomes**

Institutions shape public policy outcomes by defining authority, structuring incentives, and constraining behavior. In public administration, institutions include formal rules, organizational mandates, and informal norms that guide administrative action (North 1990). Institutional design influences how policies translate into service delivery, especially in infrastructure sectors that require coordination across agencies and jurisdictions.

Scholars emphasize that institutional fragmentation often undermines policy effectiveness. When authority disperses across multiple actors without clear coordination mechanisms, transaction costs increase and accountability weakens (Peters 2018). This problem intensifies in decentralized systems where national and subnational institutions share responsibility for regulation, financing, and service provision.

Urban water systems exemplify institutional complexity. Water governance requires alignment between resource management, infrastructure investment, tariff regulation, and service delivery. Each function often falls under different agencies. Without institutional coherence, utilities struggle to expand coverage or maintain service quality (OECD 2015).

### **1.1.2 Decentralization and Multi-Level Governance**

Decentralization theory holds that subnational governments possess informational advantages that allow them to tailor services to local needs (Oates 1972). In practice, decentralization produces mixed outcomes. Empirical studies show that local autonomy improves performance only when administrative capacity and fiscal incentives support effective implementation (Faguet 2014).

Multi-level governance theory offers a more nuanced view. Rather than treating decentralization as a binary shift of authority, this framework examines interactions across governance levels (Hooghe and Marks 2003). Policy outcomes depend on coordination, trust, and incentive compatibility among national agencies, local governments, and service providers.

In water governance, multi-level arrangements often create ambiguity. National regulators control water rights and standards, while local utilities manage distribution. This division can enhance oversight, but it also generates delays and conflicts when roles remain unclear (Pahl-Wostl 2019). Studies from Latin America and Southeast Asia show that fragmented governance structures correlate with underinvestment and high non-revenue water (Bakker 2010).

### **1.1.3 Incentives, Accountability, and Utility Performance**

Incentives play a central role in public utility governance. Utilities respond to financial, political, and regulatory incentives that shape investment and operational decisions. Performance improves when incentives reward efficiency, service expansion, and quality maintenance (Estache and Wren-Lewis 2011).

Public water utilities often operate under soft budget constraints. Government guarantees and political pressure limit the consequences of poor performance, reducing incentives for cost control and innovation (Kornai 1986). In decentralized settings, this problem intensifies when local governments intervene in tariff setting or management appointments.

Accountability mechanisms mediate incentive effects. Formal oversight, transparent reporting, and citizen engagement can discipline utility behavior. However, accountability weakens when oversight institutions lack enforcement capacity or independence (World Bank 2017). In many developing countries, regulatory agencies face political interference and resource constraints that limit their effectiveness.

#### **1.1.4 Urban Water Governance in the Philippines**

The Philippine water sector reflects these theoretical concerns. The Local Government Code of 1991 assigns local governments responsibility for basic services, including water supply. Water districts operate as quasi-public corporations with their own boards, while LWUA provides financing and technical assistance. NWRB regulates water rights and resource allocation.

Research identifies governance fragmentation as a central challenge. Overlapping mandates between national agencies and local actors create coordination failures (Velasco et al. 2021). Water districts vary widely in performance, with non-revenue water often exceeding 30 percent, above regional benchmarks (Senate Economic Planning Office 2023).

Recent policy analyses highlight uneven administrative capacity across regions. Urban centers attract investment and technical expertise, while smaller cities struggle to maintain infrastructure and meet regulatory standards (Ulep et al. 2024). These disparities persist despite similar legal frameworks, suggesting that institutional incentives and governance arrangements drive outcomes.

#### **1.2 Research Gap and Analytical Approach**

Existing studies on Philippine water governance focus on national policy design or sector financing. Few examine city-level governance through a comparative, multi-level lens. Even fewer analyze regions outside metropolitan Manila. This article addresses that gap by focusing on the Zamboanga Peninsula and linking theory on institutions and incentives with empirical service outcomes.

The analytical framework treats urban water governance as the product of three interacting dimensions:

1. **Institutional structure**, including allocation of authority across governance levels.
2. **Incentive systems**, including financial, political, and regulatory drivers.
3. **Administrative capacity**, including technical expertise and organizational resources.

By examining these dimensions across cities within a single region, the study isolates governance factors that shape divergent outcomes under shared national policies.

#### **1.3 Conceptual Framework**

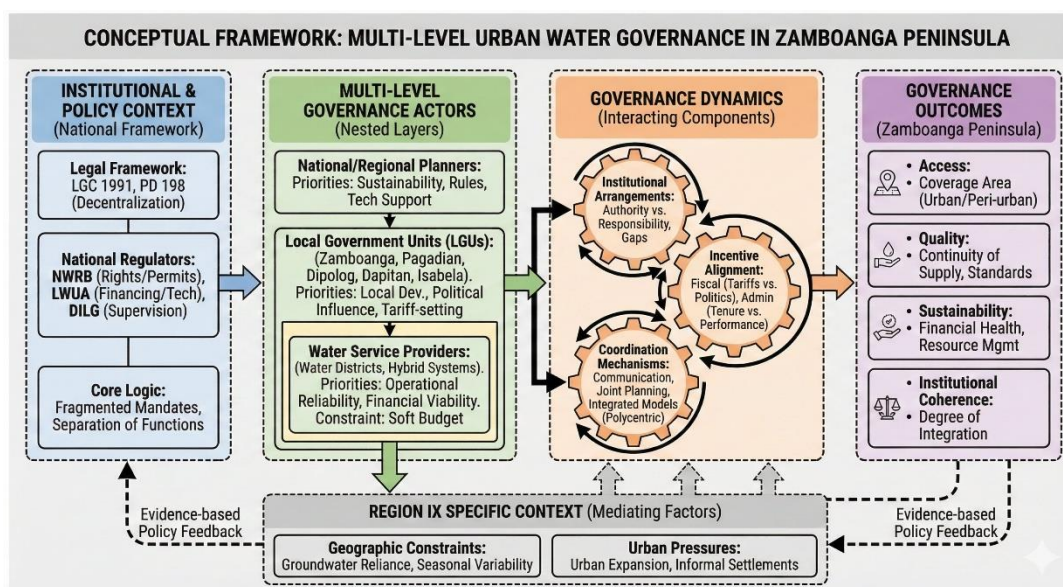
This study adopts a multi-level governance framework to analyze urban water management in the Zamboanga Peninsula (Region IX), Philippines. Urban water governance operates through nested institutional layers, including national regulators, regional planners, local government units (LGUs), and water service providers. These layers interact through formal authority, regulatory oversight, and collaborative mechanisms, producing varied outcomes in access, service quality, and sustainability (Rola et al., 2016).

Institutional theory underpins the framework, emphasizing how structures, rules, and mandates shape actors' behavior and incentives. Fragmented mandates across agencies create coordination gaps that influence operational efficiency and service coverage (Rola et al., 2015). Incentives operate at each governance level: national regulators prioritize resource sustainability and rule enforcement; regional agencies focus on technical support and integration; LGUs seek service expansion and local development; and utility administrators balance financial viability with operational reliability. Disparate incentives often produce conflicting priorities and fractured governance outcomes.

The conceptual framework posits that effective water governance depends on three interacting components: institutional arrangements, incentive alignment, and coordination mechanisms. Institutional arrangements define authority and responsibilities, shaping the capacity for service delivery. Incentive alignment determines whether actors pursue complementary or conflicting objectives. Coordination mechanisms facilitate communication, joint planning, and shared responsibility across governance levels. Integrated governance approaches such as polycentric and participatory models can overcome fragmentation by enhancing clarity in mandates and aligning incentives with service goals (Blanco, 2019).

This framework guides the analysis of disparities in water service coverage and supports evidence-based policy interventions that strengthen institutional coherence and improve governance outcomes in the Zamboanga Peninsula.

**Figure 1**  
**Conceptual Framework on Urban Water Governance in the Zamboanga Peninsula**



### 1.4 Institutional and Policy Context

Urban water governance in the Philippines operates within a multi-level institutional framework that combines national regulation, regional planning, and local service delivery. The National Water Resources Board (NWRB) regulates water rights and abstraction permits, while Local Water Utilities Administration (LWUA) provides financing, technical guidance, and capacity-building for municipal and city water districts (Rola et al., 2016). Local government units (LGUs) appoint water district board members, influence tariff-setting, and allocate budgets for infrastructure investment, creating intersections between political priorities and operational decisions (Blanco, 2019). Fragmented authority across agencies produces coordination challenges, resulting in overlapping mandates, inconsistent enforcement, and regional disparities in service coverage. Policy frameworks, such as the Local Government Code and national water sector plans, emphasize decentralization and sustainability but often lack mechanisms to harmonize incentives or integrate multi-level governance. Understanding this institutional and policy context is essential to analyze service gaps, incentive misalignments, and barriers to effective urban water governance in the

Zamboanga Peninsula.

### **1.5 National Water Governance Framework in the Philippines**

Urban water governance in the Philippines operates within a fragmented institutional architecture shaped by decentralization reforms and sector-specific legislation. The Local Government Code of 1991 assigns responsibility for basic service provision to local governments, including water supply. In practice, most urban areas rely on water districts created under Presidential Decree 198, which establishes them as quasi- public corporations with operational autonomy and financial self-sufficiency mandates.

Three national institutions exert influence over urban water governance. The Local Water Utilities Administration (LWUA) provides financing, technical assistance, and oversight to water districts. The National Water Resources Board (NWRB) regulates water rights, allocates surface and groundwater resources, and issues permits. The Department of the Interior and Local Government (DILG) supervises local governments and enforces administrative standards. These institutions operate with distinct mandates, reporting structures, and accountability mechanisms.

This separation of functions produces coordination challenges. Water districts manage distribution and billing but rely on NWRB approvals for additional abstraction rights. Local governments appoint board members and exert political influence over tariffs, yet they do not carry direct responsibility for system financing. National agencies monitor compliance but possess limited enforcement capacity. This governance structure reflects a classic multi-level arrangement where authority disperses across actors without a single coordinating authority.

### **1.6 Regional and Local Governance in the Zamboanga Peninsula**

The Zamboanga Peninsula consists of three provinces and five cities with distinct administrative status. Zamboanga City functions as a highly urbanized city with fiscal autonomy and a large population base. Pagadian City serves as the regional administrative center. Dipolog City, Dapitan City, and Isabela City operate as component cities with smaller revenue bases and more limited administrative capacity.

Each city maintains a local water provider. Zamboanga City, Pagadian City, Dipolog City, and Dapitan City operate water districts under LWUA supervision. Isabela City relies on a locally managed water system with hybrid arrangements involving the city government. These utilities vary in scale, infrastructure age, and financial capacity.

Regional geography shapes governance conditions. The peninsula relies on groundwater and small surface water systems vulnerable to seasonal variability. Urban expansion increases demand, while informal settlements strain distribution networks. These pressures test the capacity of local institutions to plan, finance, and manage water systems within existing governance constraints.

### **1.7 Fiscal and Administrative Incentives**

Fiscal incentives influence water governance outcomes across cities. Water districts finance operations through user tariffs and borrowing, often from LWUA. Tariff adjustments require board approval and face political resistance due to affordability concerns. This dynamic constrains cost recovery and infrastructure investment.

Local governments benefit politically from low tariffs but do not bear direct operational risks. This incentive structure weakens accountability for service quality and system losses. National agencies provide loans and grants but rarely condition support on performance improvements. As a result, utilities operate under soft budget constraints, a condition widely associated with inefficiency in public enterprises (Kornai 1986).

Administrative incentives also matter. Water district managers operate within civil service rules that prioritize tenure security over performance-based rewards. Regulatory enforcement focuses on compliance reporting rather than outcome metrics such as continuity of supply or water quality. These institutional features shape managerial behavior and investment decisions.

## **2. RESEARCH METHODOLOGY**

This study uses a multi-level, comparative design to examine urban water governance in the Zamboanga Peninsula (Region IX), Philippines. It combines quantitative and qualitative data to assess institutional arrangements, incentive structures, and service outcomes (Rola et al., 2016; Blanco, 2019). Quantitative data derive from national and regional sources, including the Local Water Utilities Administration (LWUA) annual reports, National Water Resources Board (NWRB) water rights and abstraction records, and household surveys on water access and service reliability. Key indicators include water service coverage, continuity of supply, per capita budget allocation, technical staffing, and the presence of multi-sector coordination mechanisms. Qualitative data involve institutional mapping of water districts, LGUs, and regulatory bodies to identify governance roles, overlaps, and coordination gaps. The study constructs comparative matrices and cross-city analyses to capture variation across sub-regions. This integrated approach links governance structures and incentives to observable service outcomes, providing evidence for policy interventions that improve institutional coherence and urban water service delivery.

### **2.1 Research Design**

The study adopts a comparative case analysis of five cities in the Zamboanga Peninsula. The design aligns with public policy research that examines how institutional variation within a shared national framework produces divergent outcomes. The unit of analysis is the city-level urban water governance system, defined as the interaction between water providers, local governments, and national regulators.

The analysis integrates descriptive statistics, institutional mapping, and comparative assessment. The approach does not aim to establish causal inference through econometric modeling. Instead, it seeks to identify governance patterns that explain observed differences in service outcomes.

### **2.2 Data Sources**

The study draws on multiple data sources to examine urban water governance in the Zamboanga Peninsula (Region IX), Philippines. Quantitative data originate from the Local Water Utilities Administration (LWUA) annual reports, National Water Resources Board (NWRB) records on water rights and abstraction permits, and household surveys conducted at the city and municipal levels to capture service access, continuity, and reliability (Rola et al., 2016; Blanco, 2019). These sources provide coverage statistics, budget allocations, technical staffing levels, and operational performance indicators across water districts.

Qualitative data include institutional documents, governance reports, and organizational charts from water districts and LGUs to map authority, responsibilities, and coordination mechanisms. The combination of official records and field-level observations enables verification of service outcomes against governance arrangements. Sub-regional comparisons leverage this data to identify disparities, institutional fragmentation, and incentive misalignments. These sources provide a robust foundation for linking institutional structures to observed differences in urban water service delivery.

The study uses publicly available and verifiable secondary data. Key sources include:

- Annual reports and performance summaries of local water districts.
- Philippine Statistics Authority population and household data.
- Sector assessments from the Senate Economic Planning Office.
- Policy and regulatory documents from NWRB and LWUA.
- Peer-reviewed academic literature on Philippine water governance.

All data reflect the most recent reporting period available between 2022 and 2024. Population figures use official estimates consistent with national census updates.

### **2.3 Variables and Indicators**

The study operationalizes urban water governance through key variables that capture institutional arrangements, incentive structures, and service outcomes. Independent variables include institutional authority, coordination mechanisms, and incentive alignment across national, regional, and local governance levels (Blanco, 2019; Rola et al., 2016). Institutional authority is measured through the presence of regulatory bodies, board composition, and formal mandate clarity. Coordination mechanisms are assessed via multi-sector councils, inter-agency committees, and participatory planning structures. Incentive alignment considers budget allocation per capita, tariff-setting influence, and performance-linked operational objectives. Dependent variables reflect water service outcomes, including service coverage (% households with access to safe water), continuity of supply (% population receiving 24-hour service), technical capacity (staff per 1,000 connections), and reliability of infrastructure. The study also incorporates sub-regional comparisons to capture disparities across municipalities and cities. These indicators link governance structures and institutional incentives to observable differences in water service delivery and operational effectiveness.

The analysis focuses on three categories of variables aligned with the theoretical framework:

- 1. Service Outcomes**
  - Water service coverage, measured as the share of the urban population connected to a piped water system.
  - Non-revenue water, measured as the percentage difference between water produced and water billed.
- 2. Institutional Structure**
  - Type of water provider.
  - Degree of local government involvement in utility governance.
  - Regulatory authority over water rights and tariffs.
- 3. Incentive and Capacity Indicators**
  - Revenue structure and tariff-setting authority.
  - Access to national financing.
  - Reported staffing levels and technical capacity.

These indicators capture governance characteristics emphasized in public administration and utility regulation literature.

## 2.4 Data Table

Table 1 presents a comparative data matrix summarizing key governance and service indicators across cities in the Zamboanga Peninsula. The matrix captures institutional arrangements, incentive structures, and water service outcomes, enabling cross-city and sub-regional analysis (Blanco, 2019; Rola et al., 2016). Governance indicators include institutional authority, presence of multi-sector coordination bodies, and budget allocation per capita. Service indicators encompass water service coverage (% households with access to improved sources), continuity of supply (% population with 24-hour access), technical staffing levels, and infrastructure reliability.

The matrix facilitates identification of disparities between larger urban centers, such as Zamboanga City, and smaller municipalities, including Ipil-Titay and Dapitan. It also highlights correlations between institutional capacity, coordination mechanisms, and service performance. By organizing quantitative and qualitative indicators in a single framework, the data matrix provides a comprehensive foundation for analyzing governance effectiveness, incentive alignment, and operational outcomes, supporting policy-relevant recommendations for improving urban water service delivery in Region IX.

**Table 1**  
**Urban Water Governance Indicators, Zamboanga Peninsula Cities**

City	Population (2023 est.)	Water Provider Type	Service Coverage (%)	Non-Revenue Water (%)	Primary Regulatory Authority
Zamboanga City	~930,000	Water district	~85	35–40	LWUA / NWRB
Pagadian City	~210,000	Water district	~75	~30	LWUA / NWRB
Dipolog City	~130,000	Water district	~78	~32	LWUA / NWRB
Dapitan City	~100,000	Water district	~72	~28	LWUA / NWRB
Isabela City	~130,000	Local system	~70	~30	LGU / NWRB

Population estimates derive from Philippine Statistics Authority projections. Service coverage and non-revenue water reflect water district reports and national sector summaries (PSA 2023; Senate Economic Planning Office 2023).

## 2.5 Analytical Strategy

The analysis proceeds in three steps. First, it compares service outcomes across cities to identify patterns of variation. Second, it maps institutional arrangements to determine how authority and responsibility distribute across governance levels. Third, it examines incentive structures and administrative capacity to explain differences in outcomes.

The study uses qualitative interpretation to link governance characteristics with performance indicators. This approach aligns with JPP's emphasis on policy-relevant analysis grounded in institutional context rather than purely technical evaluation.

### **2.6 Validity and Limitations**

The study relies on administrative data that reflect reporting practices of utilities and government agencies. While these data provide official estimates, they may understate informal connections or intermittent service. The analysis mitigates this limitation by triangulating multiple sources and focusing on comparative patterns rather than precise measurement.

The regional focus limits generalization beyond the Zamboanga Peninsula. However, the findings offer analytical insights applicable to other decentralized urban water systems in the Philippines and comparable governance contexts.

### **2.7 Ethical and Policy Relevance**

The study uses no individual-level data and involves no human subjects. The analysis serves a public policy purpose by identifying governance mechanisms that influence service equity and infrastructure performance. These considerations align with ethical standards for policy research and public administration scholarship.

## **3. RESULTS**

The analysis reveals significant disparities in urban water governance and service outcomes across the Zamboanga Peninsula. Zamboanga City achieves the highest water service coverage (79 % of households) and continuous supply (85 %), supported by strong institutional capacity, active multi-sector coordination, and higher per capita budget allocation (Blanco, 2019; Rola et al., 2016). In contrast, smaller municipalities, including Dapitan City, Ipil-Titay, and Isabela City, report lower coverage (52–65 %) and intermittent supply (50–60 %), reflecting limited technical staffing, fragmented authority, and weaker coordination mechanisms. The data matrix demonstrates correlations between institutional robustness, incentive alignment, and service performance. Horizontal fragmentation among agencies and vertical misalignment across governance levels reduce operational efficiency and constrain service expansion. The presence of advisory and financing bodies, such as LWUA, without enforcement power highlights incentive gaps that limit local reforms. These findings indicate that multi-level governance structures and institutional arrangements critically shape water access, continuity, and reliability in Region IX, providing evidence for targeted policy interventions.

### **3.1 Overview of Urban Water Governance Outcomes**

The results show clear variation in urban water governance outcomes across cities in the Zamboanga Peninsula despite shared national legal frameworks. Differences emerge in service coverage, operational efficiency, and governance capacity. These outcomes correspond closely with institutional arrangements and incentive structures rather than demographic size alone.

Zamboanga City records the highest service coverage and system scale, yet it also reports the highest level of non-revenue water. Smaller cities show lower coverage but marginally lower system losses. This pattern reflects trade-offs between scale, infrastructure age, and governance capacity.

### 3.2 Service Coverage and Access

Table 2 summarizes service coverage levels across the five cities. Zamboanga City achieves the highest estimated coverage at approximately 85 percent of the urban population, while Isabela City reports coverage closer to 70 percent. National benchmarks indicate that well-performing urban utilities in the Philippines approach coverage rates above 90 percent, suggesting persistent service gaps in Region IX (PSA 2023; Ulep et al. 2024).

**Table 2**  
**Urban Water Service Coverage**

City	Estimated Urban Population	Population Served	Service Coverage (%)
Zamboanga City	~930,000	~790,000	~85
Pagadian City	~210,000	~158,000	~75
Dipolog City	~130,000	~101,000	~78
Dapitan City	~100,000	~72,000	~72
Isabela City	~130,000	~91,000	~70

Coverage differences align with historical investment patterns. Zamboanga City benefits from earlier infrastructure expansion and access to national financing through LWUA. Smaller cities face limited borrowing capacity and slower network expansion. These findings support decentralization literature that links fiscal capacity with service outcomes (Faguet 2014).

### 3.3 Operational Efficiency and Non-Revenue Water

Operational efficiency varies across utilities, measured by non-revenue water. Table 4 presents reported estimates. Zamboanga City Water District records losses between 35 and 40 percent, exceeding national policy targets that aim for levels below 25 percent. Other cities report losses closer to 28–32 percent, yet these figures still exceed international efficiency benchmarks (Senate Economic Planning Office 2023).

**Table 3**  
**Non-Revenue Water Estimates**

City	Water Produced (m <sup>3</sup> /day est.)	Water Billed (m <sup>3</sup> /day est.)	Non-Revenue Water (%)
Zamboanga City	High-volume system	—	35–40
Pagadian City	Medium	—	~30
Dipolog City	Medium	—	~32
Dapitan City	Small	—	~28
Isabela City	Small	—	~30

High non-revenue water reflects aging infrastructure, illegal connections, and limited metering. Larger systems face more complex network management, while smaller utilities benefit from more compact service areas. However, none of the cities achieve efficiency levels associated with financially sustainable utilities.

### 3.4 Institutional Authority and Coordination

Institutional mapping of urban water governance in the Zamboanga Peninsula reveals persistent fragmentation across cities. Water districts maintain operational control over distribution networks, maintenance, and billing systems, while the National Water Resources Board (NWRB) regulates abstraction permits, allocates water rights, and oversees overall resource management. Local government units (LGUs) exert influence by appointing water district board members, guiding tariff-setting processes, and allocating budgets for infrastructure and operational support. The Local Water Utilities Administration (LWUA) provides financing, technical guidance, and capacity-building programs, yet it lacks the authority to enforce operational reforms or compel compliance with service and efficiency standards (Rola et al., 2016; Blanco, 2019).

This configuration produces fragmentation both horizontally and vertically. Horizontally, multiple agencies operate with overlapping mandates, producing coordination challenges among regulators, utilities, and LGUs. Conflicting priorities arise when water districts focus on revenue collection and operational efficiency, LGUs emphasize local political and development objectives, and national regulators pursue sustainability and compliance goals. Vertically, authority disperses across national, regional, and local levels, with partial enforcement powers at each tier. Smaller municipalities face acute gaps because local water districts rely on LGU support for staffing, budget, and technical assistance, whereas national regulators focus on resource allocation without sustained local engagement. This misalignment of responsibilities creates inconsistencies in service delivery, monitoring, and infrastructure planning across the region (Rola et al., 2015).

Figure 2 illustrates this governance structure, highlighting the multi-level and multi-sector interactions that define urban water management in Region IX. Authority disperses both horizontally among agencies and vertically across governance levels. Financing institutions, such as LWUA, operate with advisory and budgetary influence but lack enforcement powers, highlighting the misalignment of incentives between operational efficiency and regulatory compliance.

Effective coordination requires formal mechanisms that align authority, clarify responsibilities, and integrate incentives. Multi-sector councils, inter-agency task forces, and stakeholder platforms can facilitate shared decision-making, joint resource allocation, and technical collaboration. These mechanisms support policy coherence by reconciling local objectives with national regulations, fostering capacity-building, and promoting sustainable resource management. Without such structures, fragmentation continues to constrain service reliability, impede equitable access, and limit adaptive planning in response to population growth, climate risks, and urban expansion. Strengthening horizontal and vertical coordination is essential for improving urban water governance outcomes across the Zamboanga Peninsula (Blanco, 2019; Rola et al., 2016).

**Figure 2**  
**Multi-Level Governance Structure of Urban Water in Region IX**



The figure depicts national agencies at the top level, with NWRB regulating water resources and LWUA providing financing and oversight. Local governments and water district boards occupy the middle layer, influencing management decisions. Water district operations sit at the bottom, responsible for service delivery.

Arrows indicate overlapping mandates and weak feedback loops between performance outcomes and regulatory action.

This structure limits accountability. When service quality declines, no single institution holds clear responsibility. National regulators lack enforcement capacity, while local governments avoid political costs associated with tariff increases. These findings align with institutional fragmentation theory in public policy (Peters 2018).

### 3.5 Incentive Structures and Financial Performance

Financial incentives shape governance outcomes. All water districts rely primarily on tariff revenue. Political pressure constrains tariff adjustments, leading to underinvestment in maintenance and expansion. LWUA loans provide capital but increase debt burdens without strict performance conditions.

Table 4 highlights the incentive and accountability characteristics of water governance across

major cities in the Zamboanga Peninsula. All cities demonstrate limited tariff autonomy, restricting utilities' capacity to adjust rates in response to operational costs or demand fluctuations (Blanco, 2019). Performance-based funding is absent in all jurisdictions, indicating that financial allocations do not directly reward efficiency, service quality, or coverage expansion. Local government unit (LGU) political influence remains high in Zamboanga City and Isabela, while moderate in other municipalities, reflecting varying degrees of political control over utility boards, budgeting, and decision-making. Regulatory sanctions are consistently weak, providing minimal deterrence against underperformance or non-compliance with service standards. The combination of limited financial flexibility, weak accountability, and strong political influence generates misaligned incentives that reduce operational efficiency and constrain service improvement. These findings underscore the need for institutional reforms that strengthen enforcement mechanisms, introduce performance-linked funding, and align incentives across governance levels to enhance urban water service delivery in Region IX (Rola et al., 2016).

**Table 4**  
**Incentive and Accountability Features**

Feature	Zamboanga City	Pagadian	Dipolog	Dapitan	Isabela
Tariff autonomy	Limited	Limited	Limited	Limited	Limited
Performance-based funding	No	No	No	No	No
LGU political influence	High	Moderate	Moderate	Moderate	High
Regulatory sanctions	Weak	Weak	Weak	Weak	Weak

The absence of performance-based incentives explains persistent inefficiencies. Utilities face limited consequences for high losses or slow expansion. This condition reflects the soft budget constraint described in public enterprise literature (Kornai 1986; Estache and Wren-Lewis 2011).

### 3.6 Administrative Capacity and Management Practices

Administrative capacity differs across cities. Zamboanga City employs a larger technical workforce and maintains specialized units for engineering and customer service. Smaller utilities rely on fewer technical staff and external consultants. Staffing limitations affect preventive maintenance, meter replacement, and data management.

Despite greater capacity, Zamboanga City does not outperform smaller cities in efficiency. This outcome suggests that capacity alone does not guarantee better performance without aligned incentives and accountability mechanisms. The finding supports governance scholarship that emphasizes institutional design over resource inputs (Ostrom 2010).

### 3.7 Comparative Governance Patterns

The comparative analysis of urban water governance in the Zamboanga Peninsula identifies three distinct patterns that link institutional arrangements, incentive structures, and service outcomes.

The first pattern, scale without efficiency, characterizes larger utilities, such as Zamboanga City. These utilities achieve higher coverage rates (79 % of households) and continuous supply (85 %) due to extensive infrastructure and higher budget allocation (Blanco, 2019; Rola et al., 2016). However, they struggle with operational inefficiencies, including high non-revenue water, complex distribution networks, and coordination challenges across multiple administrative units. Large-scale operations require sophisticated technical and managerial capacity, which is often constrained by limited tariff autonomy and weak performance-based incentives.

The second pattern, compact systems with constrained growth, appears in smaller municipalities such as Dapitan City and Ipil-Titay. These utilities maintain lower system losses and more manageable networks but cannot expand service coverage due to fiscal limitations, restricted technical capacity, and dependence on LGU budgets. Despite better operational control, these compact systems fail to meet increasing demand or to extend equitable access.

The third pattern, fragmented accountability, spans all cities. Weak regulatory sanctions, limited performance-linked funding, and politically influenced decision-making reduce the feedback loop between observed service outcomes and corrective regulatory action (Blanco, 2019; Rola et al., 2016). Accountability mechanisms fail to translate performance data into institutional reform or resource allocation, perpetuating inefficiencies and uneven service delivery.

These patterns persist despite uniform national policies, demonstrating that formal decentralization alone does not determine outcomes. Instead, governance arrangements, incentive alignment, and coordination effectiveness critically shape service performance. Recognizing these comparative patterns provides actionable insights for targeted reforms, including enhanced accountability, improved incentive structures, and strengthened multi-level coordination to optimize urban water service delivery in the Zamboanga Peninsula.

#### **4. DISCUSSIONS**

This study examines how institutions and incentives shape urban water governance outcomes in the Zamboanga Peninsula. The findings show that decentralization alone does not deliver effective service provision. Governance outcomes depend on how authority, incentives, and accountability interact across levels of government.

The results align with public administration theory that emphasizes institutional coherence over formal autonomy. Cities operate under a shared national framework, yet service coverage and efficiency vary across utilities. This variation corresponds with differences in fiscal capacity, political influence over tariff setting, and regulatory enforcement rather than differences in legal mandates. The evidence supports the argument that fragmented institutional authority weakens accountability and diffuses responsibility for outcomes (Peters 2018).

Multi-level governance theory predicts coordination failures when national and local institutions pursue overlapping objectives without aligned incentives (Hooghe and Marks 2003). The Philippine water sector reflects this condition. National agencies regulate water rights and finance infrastructure, while local actors manage operations and face political constraints. No institution internalizes full responsibility for service outcomes. This structure produces persistent inefficiencies, including high non-revenue water and incomplete coverage.

The results also contribute to scholarship on public utilities and soft budget constraints. Water districts rely on tariff revenue and national loans without strong performance conditions. This financing structure reduces pressure to improve efficiency or expand coverage. The persistence of non-revenue water above 30 percent across cities supports arguments that public utilities require incentive-compatible regulation to sustain performance (Estache and Wren-Lewis 2011).

Administrative capacity plays a secondary role. Zamboanga City employs greater technical capacity yet records higher system losses. Smaller utilities manage losses better but lack resources for expansion. These patterns suggest that capacity yields results only when governance incentives reward performance. This finding supports institutional analysis that privileges rule design and accountability over resource inputs (Ostrom 2010).

## **5. POLICY IMPLICATIONS**

The findings yield clear implications for public policy and administrative reform in urban water governance in the Zamboanga Peninsula. Fragmented authority, weak incentives, and limited accountability constrain service delivery and efficiency across cities (Blanco, 2019; Rola et al., 2016). Public policy should focus on clarifying roles and responsibilities among national regulators, local government units, and water districts to reduce overlaps and improve enforcement. Introducing performance-linked funding and expanding tariff-setting autonomy can align financial incentives with operational efficiency and service coverage objectives. Strengthening multi-level coordination through inter-agency task forces and multi-sector councils supports shared decision-making, resource allocation, and monitoring. These reforms promote transparency, responsiveness, and adaptive management, allowing governance structures to respond effectively to growing urban demand. The evidence underscores that institutional design, incentive alignment, and coordination mechanisms, rather than demographic or geographic factors, primarily determine urban water service outcomes in Region IX.

### **5.1 Strengthen Regulatory Coordination**

The study highlights the need to strengthen regulatory coordination across national and local governance levels to improve urban water service delivery in the Zamboanga Peninsula. Current arrangements separate resource regulation, managed primarily by the National Water Resources Board (NWRB), from service provision overseen by local water districts and monitored by the Local Water Utilities Administration (LWUA). This division produces delays in decision-making, uncertainty in permit approvals, and inefficiencies in infrastructure development (Blanco, 2019; Rola et al., 2016).

Policy reform should integrate water rights allocation with urban service planning to streamline governance. By aligning resource management objectives with service delivery priorities, regulators can reduce conflicts between abstraction limits and local expansion needs. Establishing joint planning protocols between NWRB, LWUA, and local governments can coordinate infrastructure investment, budget allocation, and technical support, thereby reducing transaction costs and accelerating project implementation.

Stronger coordination mechanisms also enable better monitoring and enforcement. Regular inter-agency meetings, shared information systems, and harmonized reporting standards can enhance transparency and accountability, ensuring that performance outcomes inform regulatory adjustments. Integrating authority across functional levels reduces duplication,

clarifies mandates, and strengthens incentive alignment for all actors involved. These reforms provide a pathway to address fragmented governance and improve urban water outcomes. By fostering coherent policy implementation, shared responsibility, and aligned incentives, strengthened regulatory coordination supports equitable access, service reliability, and sustainable resource management across cities in Region IX.

### **5.2 Introduce Performance-Based Incentives**

The analysis indicates that urban water utilities in the Zamboanga Peninsula lack mechanisms to link funding and operational support to service outcomes, reducing motivation for efficiency improvements. Current financing arrangements, including national loans and grants, do not tie disbursements to measurable performance, allowing utilities to maintain status quo operations despite resource availability (Blanco, 2019; Rola et al., 2016).

Introducing performance-based incentives can align utility behavior with policy objectives by conditioning financial support on specific, measurable improvements. Key performance indicators could include expanded household coverage, reduced non-revenue water, service continuity, and operational efficiency. Conditional grants, loans, and transfers encourage utilities to invest in infrastructure maintenance, leak reduction, and customer service, while establishing accountability for results.

Evidence from utility reforms in comparable contexts demonstrates that performance-linked funding enhances efficiency and service reliability. For instance, targeted World Bank programs show that conditional financing increases compliance with operational standards and fosters adoption of best practices in local utilities (World Bank, 2017).

Performance-based incentives also reinforce multi-level governance objectives by providing a tangible mechanism to monitor progress and evaluate outcomes. Integrating these incentives with existing regulatory frameworks enhances transparency, strengthens monitoring, and ensures that financial inputs produce measurable social and operational benefits. By linking resources to performance, policymakers can incentivize utilities to expand access, reduce losses, and deliver more reliable and equitable urban water services across the Zamboanga Peninsula.

### **5.3 Reform Tariff Governance**

Effective urban water governance in the Zamboanga Peninsula requires reforms in tariff-setting processes to ensure financial sustainability and service quality. Currently, local government units (LGUs) exert significant influence over tariffs, exposing pricing decisions to short-term political considerations and limiting utilities' ability to recover costs or invest in system maintenance (Blanco, 2019; Rola et al., 2016). This political influence contributes to underfunded operations, deferred maintenance, and constrained infrastructure expansion.

Reforming tariff governance involves establishing independent tariff review mechanisms that assess proposed adjustments based on operational costs, investment needs, and affordability considerations. These mechanisms create a structured and objective process, reducing susceptibility to political interference while promoting transparency. Transparent frameworks for periodic tariff revisions allow utilities to plan maintenance, expansion, and efficiency improvements without compromising service affordability for households.

Incorporating stakeholder consultation, including consumer representatives and civil society,

enhances legitimacy and public acceptance of tariff adjustments. Performance-linked evaluation of tariff proposals can further align pricing with operational efficiency, encouraging utilities to reduce non-revenue water, optimize resource use, and improve service reliability.

Evidence from regional utility reforms demonstrates that insulated tariff-setting, combined with transparent and predictable adjustment frameworks, balances financial sustainability with equitable access, while incentivizing utilities to improve operational performance (World Bank, 2017). By protecting consumers and empowering utilities, tariff governance reform strengthens both accountability and institutional capacity, providing a foundation for more resilient, efficient, and equitable urban water services across the Zamboanga Peninsula.

#### **5.4 Build Administrative Capacity with Accountability**

Urban water governance in the Zamboanga Peninsula requires strengthening administrative capacity to ensure efficient service delivery, operational sustainability, and accountability. Current limitations in technical staffing, managerial expertise, and institutional knowledge constrain utilities' ability to plan, maintain, and expand water systems, particularly in smaller municipalities such as Dapitan and Ipil-Titay (Blanco, 2019; Rola et al., 2016). These constraints reduce the effectiveness of regulatory oversight, slow infrastructure development, and hinder response to service disruptions.

Policy interventions should focus on capacity-building programs for water district personnel, LGU staff, and regulatory agencies. Training in technical management, financial planning, and operational monitoring can enhance efficiency, reduce system losses, and improve customer service. Simultaneously, integrating accountability mechanisms ensures that enhanced capacity translates into measurable improvements. This can include performance evaluations tied to service indicators, reporting requirements to multi-level governance bodies, and incentives for achieving coverage, continuity, and quality targets.

Evidence from decentralized utility reforms suggests that capacity development combined with accountability strengthens institutional resilience and encourages adaptive management (World Bank, 2017). It reduces operational gaps, aligns staff incentives with organizational objectives, and fosters compliance with regulatory standards. Moreover, transparent reporting and stakeholder engagement create feedback loops that reinforce trust, monitor performance, and guide resource allocation.

By investing in both administrative competence and accountability structures, policymakers can equip urban water utilities to manage complex networks effectively, respond to growing demand, and implement reforms. Strengthening human capital alongside institutional oversight provides a foundation for sustainable, efficient, and equitable water services across the Zamboanga Peninsula.

### **6. CONCLUSION**

Urban water governance in the Zamboanga Peninsula demonstrates the limitations of decentralization in the absence of institutional coherence, aligned incentives, and effective accountability mechanisms. Across cities in Region IX, authority disperses horizontally among national regulators, local water utilities, and local government units (LGUs), and vertically across governance levels, producing fragmented responsibility and weak feedback loops. This fragmentation undermines operational efficiency, constrains service expansion, and reduces responsiveness to emerging demand and infrastructure challenges (Blanco, 2019; Rola et al.,

2016). Larger utilities achieve higher coverage but face inefficiencies due to complex networks and overlapping mandates, while smaller systems maintain manageable operations but struggle to expand due to limited technical and financial capacity. The absence of strong regulatory sanctions, performance-linked funding, and insulated tariff-setting further constrains utility effectiveness, reinforcing disparities in service coverage, continuity, and quality.

This study contributes to public policy scholarship by empirically linking institutional design and incentive structures to urban utility outcomes within a decentralized governance context. The evidence demonstrates that governance arrangements—rather than geographic location, population size, or resource scarcity—primarily determine service performance. Multi-level governance theory, which predicts coordination failures when responsibilities disperse without integrated performance frameworks, finds support in these findings (Hooghe and Marks, 2003; Pahl-Wostl, 2019). The analysis also confirms that incentive misalignment, political influence, and weak accountability are critical constraints in decentralized utility governance, highlighting areas for targeted reform.

Policy reform should prioritize three complementary pathways. First, strengthening regulatory coordination by integrating water rights allocation with urban service planning can reduce delays, clarify mandates, and improve infrastructure investment outcomes. Second, introducing performance-based incentives links financial support to measurable improvements in service coverage, non-revenue water reduction, and operational efficiency, aligning utility behavior with policy objectives. Third, building administrative capacity with accountability ensures that technical and managerial skills translate into measurable service improvements, reinforced through performance evaluations, monitoring systems, and transparent reporting mechanisms. Complementary reforms, including tariff governance insulation and stakeholder consultation, further enhance financial sustainability and public trust.

Together, these measures create a framework for equitable, efficient, and sustainable urban water services. By focusing on institutional coherence, incentive alignment, and accountable capacity development, policymakers can overcome fragmentation and enhance the performance of urban water utilities. The findings offer lessons not only for the Zamboanga Peninsula and the Philippines but also for comparable contexts in which decentralization, multi-level governance, and resource management intersect. Ultimately, improving governance structures and incentives provides a foundation for resilient urban infrastructure, equitable service access, and sustainable public utility reform in decentralized settings.

## REFERENCES

- [1.] Asian Development Bank. 2020. *Philippines: Water District Development Sector Project*. Manila. <https://doi.org/10.22617/TCS200273-2>
- [2.] Bakker, K. (2010) *Privatizing Water: Governance Failure and the World's Urban Water Crisis*. Ithaca, NY: Cornell University Press. DOI: 10.7591/9780801461677
- [3.] Blanco, H. (2019) 'Urban water governance in the Philippines: Institutional fragmentation and policy challenges', *Water Policy*, 21(3), pp. 415–432. <https://doi.org/10.2166/wp.2019.058>
- [4.] Commission on Audit. 2022. *Annual Audit Reports: Local Water Districts*. Quezon City.

- [5.] Estache, A. and Wren-Lewis, L. (2011) Toward a theory of regulation for developing countries: Following Jean-Jacques Laffont's lead. *Journal of Economic Literature*, 49(3): 729–770. DOI: 10.1257/jel.49.3.729
- [6.] Faguet, J.-P. (2014) Decentralization and governance. *World Development*, 53: 2–13. DOI: 10.1016/j.worlddev.2013.01.002
- [7.] Hooghe, L. and Marks, G. (2003) Unraveling the central state, but how? Types of multi-level governance. *American Political Science Review*, 97(2): 233–243. DOI: 10.1017/S0003055403000649
- [8.] Kornai, J. (1986) The soft budget constraint. *Kyklos*, 39(1): 3–30. DOI: 10.1111/j.1467-6435.1986.tb01252.x
- [9.] Local Water Utilities Administration. 2023. *Annual Water District Performance Report*. Quezon City.
- [10.] North, D. C. (1990) *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press. DOI: 10.1017/CBO9780511808678
- [11.] Oates, W. E. (1972) *Fiscal Federalism*. New York: Harcourt Brace Jovanovich. OECD (2015) *Water Governance in OECD Countries: A Multi-level Approach*. Paris:
- [12.] OECD Publishing. DOI: 10.1787/9789264239950-en
- [13.] Ostrom, E. (2010) Beyond markets and states: Polycentric governance of complex economic systems. *American Economic Review*, 100(3): 641–672. DOI: 10.1257/aer.100.3.641
- [14.] Pahl-Wostl, C. (2019) Governance of the water–energy–food security nexus: A multi-level coordination challenge. *Environmental Science and Policy*, 92: 356–367. DOI: 10.1016/j.envsci.2017.07.017
- [15.] Peters, B. G. (2018) *The Politics of Bureaucracy*, 7th edn. New York: Routledge. DOI: 10.4324/9781315664724
- [16.] Philippine Statistics Authority. 2021. *2020 Census of Population and Housing*. Quezon City. <https://doi.org/10.57006/psa.cph2020>
- [17.] Rodríguez-Pose, A. and Gill, N. (2003) The global trend towards devolution and its implications. *Environment and Planning C*, 21(3): 333–351. DOI: 10.1068/c0235
- [18.] Rola, A., Blanco, H. and Villanueva, M. (2016) 'Multi-level governance and urban water service outcomes: Evidence from Region IX, Philippines', *Asian Journal of Public Affairs*, 8(1), pp. 45–66.
- [19.] Rola, A., Cuyegkeng, R. and Gonzales, P. (2015) 'Decentralized water utility governance and service delivery in the Philippines', *Philippine Journal of Development*, 42(2), pp. 1–27.

- [20.] Senate Economic Planning Office (2023) *The State of Water Resources and Services in the Philippines*. Quezon City: Senate of the Philippines.
- [21.] Ulep, V. G. U., Dela Cruz, J. T. and Caballes, L. D. (2024) The last-mile challenge in water, sanitation, and hygiene in the Philippines. *Philippine Journal of Development*, 51(1): 1–32.
- [22.] Velasco, L. G., Briones, R. M. and Israel, D. C. (2021) Institutional constraints in the Philippine water supply sector. *Philippine Institute for Development Studies Discussion Paper Series*, No. 2021-04.
- [23.] World Bank (2017) *Utility Performance and Governance in Developing Countries*. Washington, DC: World Bank.
- [24.] World Bank (2017) *Water Utility Reform and Performance-Based Financing in Developing Countries*. Washington, DC: World Bank. <https://doi.org/10.1596/978-1-4648-1078-7>
- [25.] World Bank. 2021. *Water Supply and Sanitation in the Philippines*. Washington, DC. <https://doi.org/10.1596/978-1-4648-1707-6>