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GOVERNING URBAN WATER AS A COMMON-POOL RESOURCE THROUGH CENTRALIZED PUBLIC–PRIVATE PARTNERSHIP: EVIDENCE FROM SEMARANG, INDONESIA

ABSTRACT: Urban water systems represent complex common-pool resources that require effective governance under conditions of increasing demand, fiscal constraints, and high coordination requirements. While existing approaches often emphasize locally embedded and participatory governance, less attention has been given to how such systems are managed in large-scale urban infrastructure contexts where local capacity is limited. This study aims to analyze how a centralized public–private partnership (PPP) functions as a governance mode for managing urban water and to examine the governance trade-offs it generates. This study employs a qualitative case study of the Semarang water supply project in Indonesia, drawing on documentary analysis, service performance data, and semi-structured interviews with key stakeholders. The findings show that centralized PPP enhances service delivery capacity by improving coordination, mobilizing investment, and expanding service coverage. However, these improvements are accompanied by a reconfiguration of accountability and participation, with decision-making concentrated among institutional actors and public involvement largely limited to informational roles. As a result, a systematic governance trade-off emerges, in which performance-based legitimacy is strengthened while procedural and participatory legitimacy remain constrained. The study contributes by demonstrating that PPP should be understood not only as a financing mechanism but as a governance arrangement that reshapes how common-pool resources are managed, particularly in contexts characterized by fiscal and institutional limitations.

KEYWORDS: *common-pool resources; public–private partnership; urban water governance; governance trade-offs; accountability; legitimacy; centralized coordination.*

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1. INTRODUCTION

Urban water governance has emerged as a major global public policy challenge under conditions of rapid urbanization, climate pressure, and increasing demand for equitable access to essential services. Despite international commitments articulated in the Sustainable Development Goals (United Nations, 2015), particularly Goal 6 on clean water and sanitation, many cities in the Global South continue to face persistent deficits in infrastructure provision, service reliability, and institutional capacity. This gap indicates that the problem of urban water is not merely technical or financial, but fundamentally a governance issue concerning how an essential and limited resource is organized, allocated, and sustained over time. This broader challenge connects urban water provision to the literature on common-pool resources (CPRs), which emphasizes the difficulty of exclusion, the risks of uneven allocation under conditions of scarcity, and the institutional challenges of governing socially essential resources that cannot be effectively managed through simple market or hierarchical mechanisms alone (Ostrom, 1990, 2010).

Within this broader debate, a central question concerns how urban water should be governed. Different governance arrangements have been used to manage water and water-related infrastructure, including conventional public provision, market-oriented reforms, and hybrid institutional configurations. Public–private partnerships (PPPs) represent one of the most prominent of these arrangements. PPPs are often justified as mechanisms for mobilizing investment, allocating risk, and improving infrastructure delivery in capital-intensive sectors (Hodge and Greve, 2007; Grimsey and Lewis, 2007; Yescombe, 2017). However, a growing body of scholarship shows that PPPs should not be treated merely as financing instruments, because they also redistribute authority, reshape accountability, and alter coordination across public and private actors (Wettenhall, 2003; Hodge and Greve, 2017; Wang et al., 2018). In this sense, PPPs are analytically important not only because they affect how infrastructure is financed, but because they constitute a governance mode through which essential public services are organized and controlled.

This debate becomes especially significant when urban water is conceptualized as a common-pool resource. Classical CPR scholarship has emphasized collective action, local rule-making, and self-governance as core principles for managing shared resources effectively (Ostrom, 1990, 2010). Subsequent work has extended this perspective by recognizing that

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complex resource systems often require polycentric and multi-level governance arrangements rather than purely localized forms of coordination (Pahl-Wostl, 2007; Pahl-Wostl, 2009). Yet urban water infrastructure presents a more complicated institutional setting than many traditional CPR cases. It depends on large-scale network systems, capital-intensive investment, technical specialization, and sustained inter-organizational coordination. Under such conditions, the governance of water may shift away from locally embedded collective arrangements toward more centralized and contract-based forms of coordination. This raises an important analytical question: when PPPs are adopted in urban water systems, do they simply provide additional financing, or do they fundamentally reconfigure how a common-pool resource is governed?

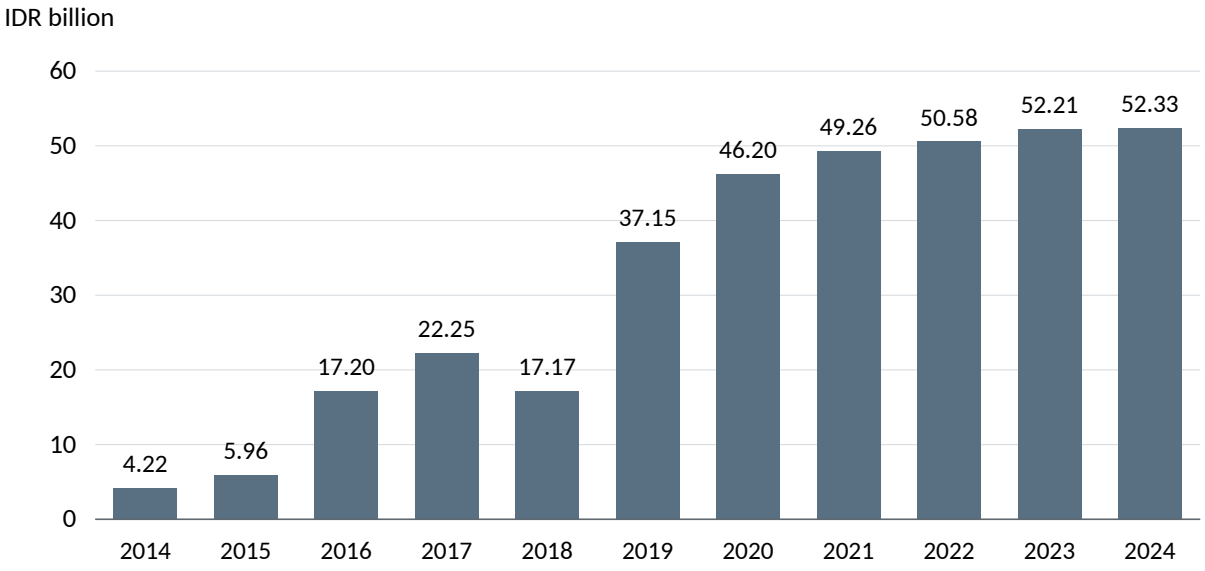
Existing studies on PPP in urban water governance have largely focused on efficiency, investment mobilization, contractual design, and service performance (Hodge, 2006; Osei-Kyei and Chan, 2015; Lima, Brochado and Marques, 2021). While these studies provide important insights, they pay more limited attention to PPP as a governance arrangement for managing urban water as a common-pool resource, particularly in contexts where strategic authority is centralized upward while the consequences of service delivery remain locally experienced. As a result, the literature still offers limited explanation of how centralized PPP governance reorganizes authority and what trade-offs it creates for service delivery, accountability, and legitimacy in essential public service sectors. This gap is especially important in middle-income and fiscally constrained urban settings, where the choice of governance arrangement is often driven not by abstract preference, but by institutional and financial necessity.

The case of Semarang, Indonesia, provides a theoretically relevant entry point into this problem. The West Semarang drinking water project emerged in a context where the local utility faced major investment demands but lacked the fiscal capacity to finance large-scale expansion independently. The project required an estimated investment of approximately IDR 1.2 trillion, while the net financial position of Perumda Air Minum Tirta Moedal reached only about IDR 52.3 billion in 2024. This fiscal gap indicates that local utility resources were insufficient relative to the scale of the required infrastructure expansion and helps explain why a PPP-based arrangement became institutionally attractive in this case. However, the issue is not simply whether external finance could be mobilized. More

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fundamentally, the case raises the question of what kind of governance arrangement is created when urban water is managed through a centralized PPP under conditions of fiscal and infrastructural constraint.

Figure 1: Net Financial Position of Semarang's Municipal Water Utility, 2014–2024



Source: *Perumda Air Minum Tirta Moedal Kota Semarang, internal administrative and financial records, 2025.*

This article addresses that question by examining how urban water infrastructure is governed as a common-pool resource through a centralized public–private partnership arrangement in Semarang. Rather than treating Semarang as a local illustration, the article positions it as a theory-relevant case for analyzing how centralized PPP governance operates under fiscal and technical constraints and how it reshapes delivery capacity, authority distribution, and accountability relations. The findings show that the arrangement strengthened implementation coordination and service expansion, but also concentrated strategic authority and displaced accountability toward administrative rather than citizen-facing channels. The article therefore argues that centralized public–private partnership governance should be understood not merely as a financing mechanism, but as a mode of governing urban water as a common-pool resource under conditions of fiscal and infrastructural constraint, generating trade-offs between service delivery capacity, accountability, and legitimacy.

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To examine these governance dynamics, the article formulates the following research questions:

RQ1. How is urban water infrastructure governed as a common-pool resource under a centralized public–private partnership arrangement?

RQ2. What governance trade-offs emerge when a centralized PPP is used to manage urban water under conditions of fiscal and infrastructural constraint?

RQ3. What are the implications of this governance arrangement for service performance, accountability, and legitimacy in urban water provision?

2. THEORETICAL FRAMEWORK

2.1 Urban Water Infrastructure as a Common-Pool Resource

Urban water infrastructure can be conceptualized as a common-pool resource (CPR), characterized by difficulties of exclusion, rivalrous use under conditions of scarcity or limited system capacity, and the need for sustained coordination across users and institutional actors. Classical CPR theory emphasizes that such resources are not effectively governed by purely hierarchical state control or unregulated markets, but require institutional arrangements that enable collective management and long-term sustainability (Ostrom, 1990, 2010).

While early CPR studies focused on natural resource systems, subsequent work has extended this framework to complex infrastructure sectors, including urban water services, where provision depends on large-scale networks, capital-intensive investment, and multi-level coordination (Pahl-Wostl, 2007; Bakker, 2010). In these contexts, governance challenges arise not only from the physical characteristics of the resource, but also from institutional fragmentation, uneven administrative capacity, and competing policy objectives.

Conceptualizing urban water as a CPR therefore shifts the analytical focus from service provision alone to the institutional arrangements through which access, allocation, and system sustainability are governed. This perspective highlights governance design as a central explanatory factor in understanding how urban water systems operate under conditions of constraint.

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2.2 Governance Modes for Managing Urban Water

Within the CPR framework, different governance modes can be used to organize the management of urban water infrastructure. These modes differ in how authority is distributed, how coordination is achieved, and how accountability is structured.

First, public hierarchical provision relies on direct state control, where public utilities manage infrastructure, finance investment, and deliver services. This model can ensure formal accountability and policy alignment, but often faces fiscal and capacity constraints, particularly in rapidly growing urban settings (Bakker, 2010).

Second, market-oriented and public–private partnership (PPP) arrangements introduce private actors into infrastructure financing, construction, and operation through contractual mechanisms. PPPs are often justified as instruments for mobilizing capital and improving efficiency in infrastructure provision (Hodge and Greve, 2007; Grimsey and Lewis, 2007; Yescombe, 2017). However, they also reconfigure governance by redistributing decision-making authority, reshaping risk allocation, and altering accountability relationships between actors (Hodge and Greve, 2017; Wang et al., 2018).

Third, community-based or participatory governance arrangements emphasize local collective action and stakeholder involvement. These models align closely with core CPR principles of self-governance and shared management but may face limitations in scaling and sustaining capital-intensive infrastructure systems (Ostrom, 1990; Pahl-Wostl, 2009).

Fourth, hybrid and multi-level governance arrangements combine hierarchical, market, and participatory elements, often involving coordination across different levels of government and sectors (Pierre and Peters, 2000; Hooghe and Marks, 2003). These arrangements are particularly relevant for complex infrastructure systems where no single governance mode is sufficient to address all coordination and capacity challenges.

This plurality of governance modes highlights that managing urban water as a common-pool resource is not a question of adopting a single optimal model, but of selecting and configuring institutional arrangements under specific contextual constraints.

This debate is especially important because CPR scholarship has traditionally emphasized collective action, local coordination, and self-governance as key principles for managing shared resources (Ostrom, 1990, 2010), whereas PPP governance introduces a

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more centralized and contractual mode of coordination involving both state and market actors (Hodge and Greve, 2007; Wang et al., 2018). From this perspective, centralized PPP does not simply add private participation to an existing governance structure. It shifts the governance logic of urban water management away from locally embedded coordination toward a more centralized, state-steered, and contract-based arrangement. The analytical question, therefore, is not only whether PPP improves infrastructure delivery, but whether it redefines how urban water as a common-pool resource is governed in practice.

2.3 Centralized PPP as a Governance Response under Constraint

In contexts characterized by fiscal limitations, infrastructural deficits, and uneven local capacity, centralized PPP arrangements may emerge as a governance response. Rather than representing a purely market-based solution, centralized PPP governance involves a reconfiguration of authority in which higher levels of government play a strategic role in project initiation, financing, and coordination.

This arrangement can be understood through the lens of coordination and capacity problems in multi-level governance systems (Agranoff and McGuire, 2003, 2017; Peters, 2015). When local utilities lack sufficient financial and technical resources to undertake large-scale infrastructure investment, central actors may intervene to structure partnerships with private entities, thereby consolidating decision-making authority and aligning project implementation with broader policy priorities.

While such centralization can enhance implementation capacity and reduce fragmentation, it also reshapes governance relationships. Decision-making authority becomes more concentrated, and accountability channels may shift away from direct citizen-facing mechanisms toward administrative and contractual forms of oversight. Centralized PPP governance therefore represents not only an institutional solution to fiscal and infrastructural constraints, but also a transformation in how urban water as a CPR is governed.

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2.4 Governance Trade-Offs and Explanatory Logic

To analyze the implications of centralized PPP governance, this study adopts an explanatory logic based on governance trade-offs. Rather than assuming that a particular governance mode is universally optimal, this approach examines how institutional arrangements simultaneously enable certain outcomes while constraining others.

Centralized PPP governance is expected to generate trade-offs across at least three dimensions:

1. service delivery capacity, including infrastructure expansion, production, and service coverage;
2. accountability and transparency, particularly the accessibility of decision-making processes and the strength of oversight mechanisms;
3. legitimacy, defined as the degree to which governance arrangements are perceived as justified and acceptable by affected populations (Suchman, 1995; Schmidt, 2013).

From a CPR perspective, these trade-offs arise because governance arrangements redistribute authority, information, and participation across actors. Concentration of authority may improve coordination and implementation efficiency, but may also reduce opportunities for participatory inclusion and weaken direct accountability channels.

This explanatory logic aligns with broader arguments in public administration that governance reforms often involve balancing competing objectives rather than achieving simultaneous optimization (Hood, 1991; Peters, 2015). The analytical focus is therefore on how governance arrangements reorganize relationships between actors and what consequences this produces across different dimensions of performance and public justification.

2.5 Analytical Framework

Building on the preceding discussion, this study conceptualizes centralized PPP as a mode of governing urban water as a common-pool resource under conditions of fiscal and infrastructural constraint.

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The analytical framework is structured as follows:

1. governance arrangement: centralized public–private partnership;
2. causal mechanisms: concentration of authority, multi-level coordination, contractual allocation of roles, and selective information flows;
3. observed outcomes: changes in service delivery capacity, accountability structures, and legitimacy conditions.

This framework enables the empirical analysis to link institutional design to observed governance outcomes, while situating the Semarang case within a broader theoretical debate on how common-pool resources are governed in complex and constrained environments. It also allows for a systematic comparison of the case against alternative modes of governing urban water as a common-pool resource, including hierarchical, market-based, and participatory arrangements.

3. METHODS

3.1 Research Design and Case Selection

This study adopts a qualitative case study design to examine how urban water infrastructure is governed as a common-pool resource under a centralized public–private partnership arrangement. The case of Semarang is selected because it represents a context in which fiscal constraint, infrastructural demand, and multi-level coordination challenges have led to the adoption of a centralized PPP governance model. A case study design is appropriate because it enables an in-depth analysis of governance mechanisms, institutional arrangements, and context-specific dynamics that cannot be adequately captured through large-N designs (Yin, 2018).

Rather than aiming for statistical generalization, the study seeks analytical generalization by linking empirical observations from the Semarang case to broader theoretical debates on common-pool resource governance, governance modes, and institutional trade-offs (Yin, 2018).

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3.2 Analytical Framework

The analysis is guided by the theoretical framework developed in Section 2, which conceptualizes urban water as a common-pool resource and examines governance modes and their associated trade-offs. Within this framework, centralized public–private partnership is treated as a specific governance arrangement characterized by the concentration of authority, contractual coordination, and multi-level institutional involvement.

Rather than treating legitimacy as a primary analytical variable, this study analyzes how governance arrangements structure authority, coordination, and accountability, and how these mechanisms produce observable outcomes in service delivery, accountability, and legitimacy. The analytical focus is therefore on identifying how centralized PPP governance operates under conditions of fiscal and infrastructural constraint and what trade-offs this arrangement generates in practice.

3.3 Data Collection

Data are drawn from multiple sources, including official policy documents, project reports, financial and service delivery data, and semi-structured interviews with key stakeholders involved in the project. These data sources are triangulated to capture both the institutional design of the PPP arrangement and its implementation outcomes.

Documentary materials include national and local policy documents, regulatory frameworks, project reports, and official administrative records related to the West Semarang drinking water project. Quantitative data are used to assess fiscal and service delivery conditions, including investment requirements, utility financial capacity, service coverage, population served, water production, and continuity of supply. These data help identify the structural constraints under which the centralized PPP arrangement emerged and operated.

Semi-structured interviews were conducted with key actors involved in the project, including government officials, utility representatives, and other relevant stakeholders. These interviews provide evidence on coordination processes, decision-making dynamics, accountability relations, and stakeholder perceptions regarding the governance arrangement.

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3.4 Data Analysis

Data are analyzed using a structured thematic approach guided by the analytical framework. The analysis proceeds in three stages. First, the study identifies the governance structure of the centralized PPP arrangement, focusing on how authority, coordination, and roles are distributed across actors. Second, it examines the mechanisms through which the arrangement operates, including coordination processes, contractual relationships, and information flows. Third, it evaluates the outcomes of this governance structure in terms of service delivery capacity, accountability, and legitimacy.

This analytical strategy allows the study to connect institutional design to observable governance consequences and to interpret the Semarang case within the broader debate on how common-pool resources are governed under conditions of fiscal and infrastructural constraint.

To enhance analytical credibility, the study applies data triangulation across documentary sources, quantitative indicators, and interview data. Ethical considerations were observed by ensuring informed consent and maintaining the confidentiality of interview participants. The study acknowledges limitations related to its single-case design, which does not aim for statistical generalization but instead supports analytical generalization within the broader framework of common-pool resource governance.

4. FINDINGS

4.1 Emergence of Centralized PPP in Governing Urban Water (RQ1)

The findings indicate that the adoption of a centralized public–private partnership (PPP) arrangement in Semarang is closely linked to structural constraints in managing urban water as a common-pool resource. As noted in the Introduction, the local utility faced significant fiscal limitations relative to the scale of required infrastructure investment, creating a gap between service demand and implementation capacity.

Under these conditions, urban water governance extends beyond a technical or financial issue and becomes a problem of organizing authority, coordination, and resource allocation in a system characterized by high demand, limited capacity, and institutional

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fragmentation. The centralized PPP arrangement emerged as a governance response that enabled higher levels of government to structure investment, coordinate actors, and facilitate implementation through contractual mechanisms.

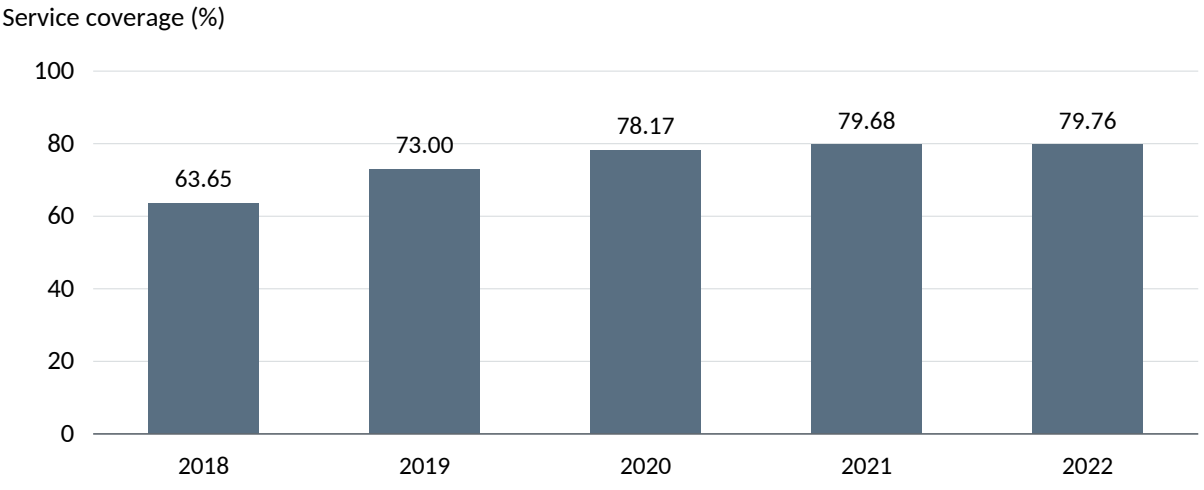
From a CPR perspective, this shift toward centralized coordination reflects an institutional response to collective action and capacity constraints, where locally embedded governance mechanisms are insufficient to manage large-scale infrastructure expansion. Instead of relying on decentralized or community-based coordination, the system is governed through a centralized and contract-based arrangement that concentrates strategic authority while maintaining operational roles across multiple actors.

This finding addresses RQ1 by showing that centralized PPP operates as a distinct governance mode for managing urban water under conditions where the coordination demands of a common-pool resource exceed the capacity of local self-governance structures.

4.2 Service Delivery Effects under Centralized PPP Governance (RQ2)

This subsection examines the service delivery effects of centralized PPP governance in Semarang, focusing on three key indicators: service coverage, population served, and water production. These indicators are used to assess changes in delivery capacity under the governance arrangement. Rather than treating performance as a single outcome, the analysis distinguishes between access expansion, service reach, and operational stability to capture how the PPP arrangement shapes different dimensions of urban water provision.

Figure 2: Drinking Water Service Coverage in Semarang, 2018–2022



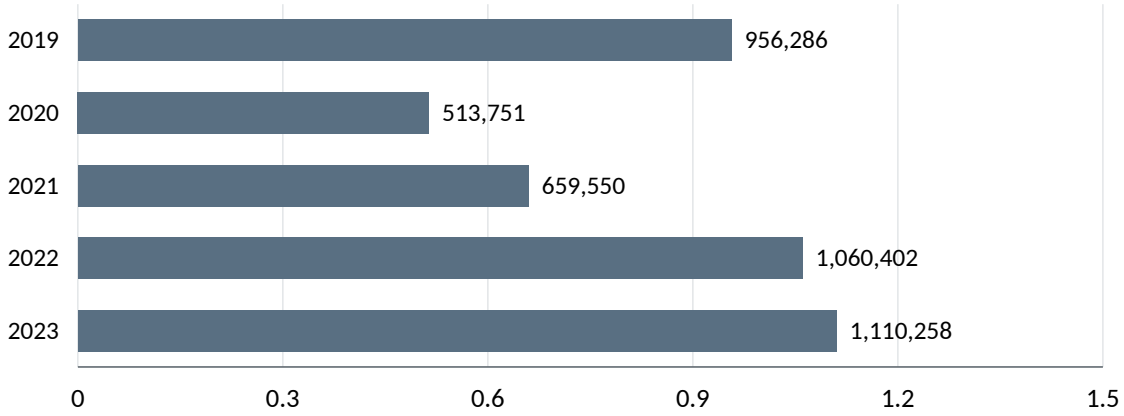
Source: *Perumda Air Minum Tirta Moedal Kota Semarang, internal service coverage records, 2025.*

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Figure 2 presents the development of drinking water service coverage in Semarang between 2018 and 2022. The data show a consistent increase from 63.65% in 2018 to 79.76% in 2022, indicating a gradual expansion in the proportion of the urban population with access to piped water services. This upward trend suggests that the governance arrangement has supported the extension of network coverage under conditions of increasing demand.

Figure 3: Expansion of Water Service Reach in Semarang, 2019–2023

Population served (millions)

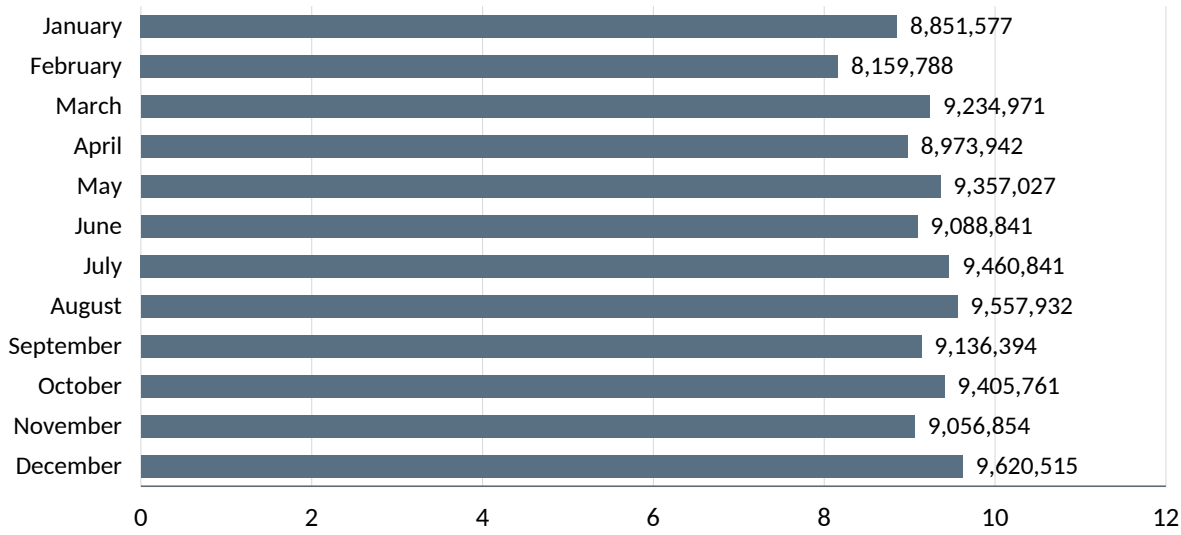


Source: *Perumda Air Minum Tirta Moedal Kota Semarang, internal service records, 2025.*

Figure 3 complements this pattern by showing the expansion of the population served between 2019 and 2023. Following a temporary decline in 2020–2021, the number of users increased substantially, reaching 1,110,258 in 2023. This pattern indicates a period of adjustment followed by recovery and expansion, suggesting that the governance arrangement has supported the scaling up of service reach after initial implementation challenges.

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Figure 4: Monthly Water Production in Semarang, 2023



Source: *Perumda Air Minum Tirta Moedal Kota Semarang, production records, 2023.*

Figure 4 presents monthly water production levels in 2023, showing relatively stable output ranging between approximately 8.1 million and 9.6 million cubic meters. This stability indicates a degree of operational consistency in water supply across different periods, suggesting that production capacity has been maintained while service demand increased.

Taken together, these indicators suggest that the centralized PPP arrangement is associated with strengthened service delivery capacity in Semarang. The increase in service coverage reflects expanded access, the growth in population served indicates an enlarged service reach, and the stability of water production points to improved operational consistency. Rather than demonstrating uniform governance success across all dimensions, these findings specifically indicate that centralized coordination under the PPP arrangement has supported the scaling and stabilization of urban water provision under conditions of fiscal and infrastructural constraint. From a CPR perspective, this reflects the capacity of a centralized and coordinated governance structure to reduce fragmentation and align infrastructure development with growing urban demand, while leaving other governance dimensions to be examined separately.

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4.3 Accountability and Participation (RQ2)

This subsection examines how centralized PPP governance reshapes accountability and participation structures in urban water provision. The analysis focuses on the distribution of decision-making authority, the nature of public engagement, and the accessibility of accountability mechanisms to citizens. These dimensions are used to assess how governance arrangements reconfigure the relationship between institutional actors and service users.

While the findings indicate improvements in service delivery capacity, interview evidence reveals that the centralized PPP arrangement substantially reshapes accountability and participation structures. Decision-making authority is predominantly concentrated among government agencies, the municipal utility, and the private partner, forming a tightly coordinated institutional core.

This concentration of authority is reflected in how decisions are made and communicated. Several respondents emphasized that public engagement occurs only after key policy decisions have been finalized, limiting the role of citizens in shaping outcomes. As one informant explained:

> *"In practice, decisions are first discussed and agreed upon between the government, the utility, and the private partner. Only after that do we inform the public. So the community is not really involved in deciding, but rather in receiving the results of those decisions."* (Interview, local government official; author's translation)

This pattern indicates that participation is structured as post-decision communication rather than as a deliberative process. Public forums, where they exist, function primarily as channels for disseminating information rather than for negotiating policy choices.

Accountability mechanisms follow a similar institutional logic. Oversight is exercised through formal reporting systems, contractual monitoring, and coordination between administrative actors. While these mechanisms provide internal control, they are less accessible to the public. As another respondent noted:

> *"There are reporting mechanisms and evaluations, but most of these are internal between institutions. The public does not have direct access to detailed information, especially regarding contracts, financing, or tariff calculations."* (Interview, utility representative; author's translation)

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From a governance perspective, these findings indicate a shift from participatory and citizen-facing accountability toward inter-institutional and contract-based forms of control. Citizens are positioned primarily as service recipients rather than as active participants in governance processes, reflecting a reconfiguration of accountability under centralized PPP governance.

4.4 Governance Trade-Offs and Legitimacy (RQ3)

This subsection examines how the governance arrangement produces trade-offs across key dimensions of performance, accountability, and legitimacy. The analysis focuses on how improvements in service delivery are balanced against changes in participation and accountability, and how these shifts shape the basis of public acceptance.

The findings collectively demonstrate that centralized PPP governance generates a structured trade-off in the management of urban water as a Common-Pool Resource. While the arrangement enhances service delivery capacity, it simultaneously narrows participatory space and reshapes accountability structures.

This trade-off becomes particularly visible when examining how legitimacy is constructed. Interview evidence suggests that public acceptance of the PPP arrangement is strongly linked to improvements in service delivery outcomes, especially the reliability of water supply. As one respondent stated:

> *"For most people, what matters is whether water flows consistently. As long as the service improves and supply becomes more reliable, people tend to accept the project, even if they are not directly involved in decision-making or do not fully understand the arrangement."* (Interview, community representative; author's translation)

This indicates that legitimacy is primarily grounded in performance outcomes rather than in participatory or procedural processes. However, this form of legitimacy is inherently conditional and dependent on continued service improvements.

At the same time, respondents highlighted that limited participation and restricted access to information can create distance between governance institutions and citizens. This reflects a departure from CPR governance models that emphasize collective action and local

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involvement (Ostrom, 1990, 2010). Instead, the centralized PPP arrangement relies on hierarchical coordination and contractual governance mechanisms.

From an analytical perspective, these findings suggest that centralized PPP governance redistributes both benefits and constraints. It strengthens coordination and service delivery performance but reduces opportunities for inclusive participation and direct accountability. As a result, legitimacy becomes uneven, shaped by the balance between improved service outcomes and limited citizen engagement.

5. DISCUSSION

5.1 Reconfiguring Common-Pool Resource Governance under Centralized PPP

This study contributes to the literature on common-pool resource (CPR) governance by showing that the management of urban water infrastructure cannot be understood solely through the classical expectation of locally embedded collective action. Foundational CPR scholarship emphasizes self-governance, local rule-making, and user-based monitoring as central mechanisms for managing shared resources effectively (Ostrom, 1990, 2010). Subsequent work has extended this perspective by recognizing that complex resource systems often require polycentric and multi-level governance rather than purely local self-regulation (Ostrom, 2010; Pahl-Wostl, 2007, 2009). However, the Semarang case indicates that in urban infrastructure settings characterized by high capital intensity, fragmented authority, and severe fiscal constraint, governance may shift even further toward centralized and contract-based coordination.

This finding refines existing CPR debates in two ways. First, it shows that the limits of local self-governance are not only social or organizational, but also infrastructural and fiscal. Urban water systems differ from many traditional CPR settings because they depend on large-scale network investment, technical specialization, and coordinated financing (Bakker, 2010; Jiménez et al., 2020). Second, it suggests that where these thresholds exceed local capacity, governance may be reorganized upward through centralized PPP arrangements. In this sense, the Semarang case extends Ostrom's concern with institutional fit by showing that governance fit in urban infrastructure may require a stronger role for centralized coordination and contractual ordering than classical CPR models would imply (Ostrom, 1990,

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2010; Pahl-Wostl, 2009). Rather than contradicting existing common-pool resource and PPP frameworks, these findings reveal their boundary conditions. Under conditions of high capital intensity, fiscal constraint, and limited local capacity, governance arrangements may systematically shift from collective-action-based models toward centralized and contract-based coordination. This shift indicates that gains in coordination and service delivery are institutionally linked to reductions in participatory inclusion and citizen-facing accountability, suggesting that prevailing theoretical expectations require refinement in large-scale urban infrastructure systems.

The theoretical contribution is therefore not to reject CPR theory, but to specify its boundary conditions. The findings suggest that centralized PPP can function as a substitute coordination mechanism when local collective-action capacity is insufficient to manage infrastructure expansion at scale. This means that urban CPR governance should be analyzed not only in terms of collective action, but also in terms of how institutional design responds to fiscal, technical, and coordinative constraints.

5.2 Governance Trade-Offs as an Institutional Effect, Not an Implementation Failure

A second contribution of the study is to identify governance trade-offs as the core explanatory mechanism linking institutional design to observed outcomes. Existing PPP scholarship has often evaluated these arrangements through efficiency, risk allocation, value for money, and implementation performance (Hodge and Greve, 2007; Grimsey and Lewis, 2007; Osei-Kyei and Chan, 2015; Hodge and Greve, 2017; Wang et al., 2018). At the same time, governance scholarship has long emphasized that multi-level and hybrid arrangements generate coordination problems, role ambiguity, and differentiated accountability (Pierre and Peters, 2000; Hooghe and Marks, 2003; Agranoff and McGuire, 2003; Peters, 2015). What these literatures do not sufficiently explain is how gains in coordination and implementation are institutionally linked to losses in participation and citizen-facing accountability.

The Semarang case demonstrates that this linkage is systematic. The same centralized and contractual mechanisms that improve investment mobilization, implementation sequencing, and service alignment also concentrate decision authority within a narrow institutional core composed of government agencies, the utility, and the private partner. In practical terms, this concentration reduces fragmentation and helps produce measurable

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delivery gains, as shown by rising service coverage, expanded service reach, and relatively stable production levels. Yet it simultaneously relocates accountability into contractual reporting, inter-agency monitoring, and administrative oversight, thereby reducing the role of direct public scrutiny and deliberative participation. This means that the observed trade-off is not best interpreted as an implementation defect, but as an institutional effect of the governance arrangement itself.

This finding sharpens both PPP and public governance debates. It supports the argument that hybrid governance arrangements should be assessed as bundled institutional configurations rather than through isolated performance indicators (Quelin, Kivleniece and Lazzarini, 2017; Reig, Gasco-Hernandez and Esteve, 2021). It also aligns with wider public administration arguments that governance reforms often involve balancing competing values—efficiency, control, accountability, participation—rather than optimizing all of them simultaneously (Hood, 1991; Peters, 2015). The contribution of this study is therefore to show that governance trade-offs are not external side effects of PPP, but one of its central institutional logics in the management of large-scale urban common-pool resources.

5.3 Legitimacy as a Conditional and Uneven Consequence of Governance Design

The study also contributes to legitimacy debates by showing that legitimacy under centralized PPP governance is neither automatic nor uniform. Governance scholarship has long distinguished between output-oriented legitimacy, which rests on performance, and input-oriented legitimacy, which rests on participation, transparency, and accountability (Scharpf, 1999; Papadopoulos, 2013; Schmidt, 2013). Related work in PPP and hybrid governance has also suggested that legitimacy problems often arise when delivery effectiveness is privileged over public visibility and democratic control (Hodge, 2006; Willems, 2014; Willems and Van Dooren, 2016; Onyoin and Bovis, 2022). The Semarang case both confirms and sharpens these arguments.

Empirically, legitimacy in this case is anchored primarily in service outcomes. Citizens and users tend to accept the arrangement because it improves water access and reliability, not because they are substantively included in strategic decision-making. This indicates that performance legitimacy is comparatively strong, whereas procedural and participatory legitimacy remain weaker. The findings therefore support the claim that legitimacy under

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centralized and contractualized governance is multi-dimensional rather than unitary (Suchman, 1995; Scharpf, 1999; Schmidt, 2013). However, they go further by showing that these legitimacy dimensions are not only analytically distinct, but unevenly distributed as a consequence of governance design.

This matters because it suggests that legitimacy under centralized PPP governance is best understood as conditional legitimacy. It is conditional because public acceptance depends heavily on the continued delivery of tangible service improvements. Where participation is limited and information is selectively distributed, legitimacy may remain effective in the short term while becoming institutionally fragile in the longer term. In the context of essential services such as water, this is particularly significant, since water governance scholarship has repeatedly shown that acceptance may erode when performance gains are not matched by transparency, accountability, and public inclusion (Bayliss, 2017; Lobina et al., 2019; Romano, Guerrini and Masserini, 2020). The theoretical implication is that legitimacy should be analyzed as a variable consequence of how authority, information, and participation are organized within governance arrangements, rather than as an inherent property of public, private, or hybrid institutional forms.

5.4 Implications for the Global Debate on PPP and Common-Pool Resource Governance

These findings suggest that prevailing approaches to common-pool resource governance and PPP should be interpreted as context-dependent rather than universally applicable. When applied to fiscally and institutionally constrained urban infrastructure systems, these frameworks generate systematic trade-offs between service delivery capacity, accountability, and legitimacy. This indicates that existing theoretical expectations should be refined to account for how governance arrangements redistribute authority, participation, and public justification in large-scale urban infrastructure systems.

Taken together, the findings contribute to the global debate on infrastructure governance by challenging two common simplifications in the literature. The first is the assumption that PPP should be understood primarily as a financing mechanism. While PPPs are often justified in terms of capital mobilization, risk sharing, and project delivery (Grimsey and Lewis, 2007; Yescombe, 2017; Wang et al., 2018), the Semarang case shows that their significance is broader: PPP operates here as a governance mode that restructures authority,

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coordination, and accountability in the management of urban water as a common-pool resource. The second simplification is the assumption that CPR governance in essential service sectors should be interpreted only through the lens of local collective action. In complex urban infrastructure systems, shared-resource governance may instead depend on centralized, state-steered, and contract-mediated coordination.

This does not mean that centralized PPP is a superior model in general terms. Rather, the findings indicate that it is a context-dependent response to specific constraints—especially fiscal weakness, fragmented authority, and large-scale infrastructure needs. Consistent with comparative governance scholarship, institutional effectiveness depends on the fit between governance mode and problem structure, not on the universal superiority of any one arrangement (Pierre and Peters, 2000; Hooghe and Marks, 2003; Peters, 2015). In the Semarang case, centralized PPP enhances coordination and delivery capacity, but it does so by redistributing governance costs toward participation, accountability, and the basis of public legitimacy.

The broader theoretical implication is that CPR theory and PPP scholarship should not be treated as separate conversations. Integrating them makes it possible to move beyond binary oppositions—state versus market, public versus private, centralized versus participatory—and instead analyze how different governance arrangements redistribute authority, capacity, and public justification under real institutional constraints. In that sense, this article offers a more general analytical proposition: when urban common-pool resources are governed through centralized PPP arrangements, coordination capacity may increase, but accountability and legitimacy become more conditional and unevenly distributed.

6. CONCLUSION

This study demonstrates that governing urban water as a common-pool resource under a centralized public–private partnership is best understood as a reconfiguration of institutional coordination rather than a mere financing arrangement. The Semarang case shows that, under conditions of fiscal constraint and infrastructural demand, centralized PPP governance enhances service delivery capacity by improving coordination, mobilizing investment, and stabilizing system performance. However, these gains are accompanied by a concentration of

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decision-making authority within institutional actors and by more limited forms of public participation.

The findings indicate that these outcomes are not incidental but reflect a systematic governance trade-off. While performance-based legitimacy is strengthened through improved service provision, procedural and participatory legitimacy remain comparatively weak. Legitimacy under centralized PPP governance therefore becomes conditional, depending more on the continued delivery of tangible service improvements than on inclusive governance processes.

Theoretically, the study contributes by showing that when urban water is governed as a common-pool resource through centralized PPP arrangements, gains in coordination and service delivery are systematically linked to reductions in participatory inclusion and citizen-facing accountability. In this sense, the study specifies the boundary conditions of prevailing common-pool resource and PPP frameworks in large-scale urban infrastructure contexts.

From a policy perspective, the findings suggest that while centralized PPP can be effective in addressing coordination and investment constraints, its design must explicitly incorporate accountability and participation mechanisms to avoid over-reliance on performance-based legitimacy. More broadly, the study highlights the need for governance frameworks that recognize and manage the trade-offs inherent in organizing large-scale public service systems under real-world institutional constraints.

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