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Institutional Framework and Governance of the Water Sector and Implications on Service Delivery

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Abstract

Water governance discourses state that "water crisis is a crisis of governance". Improving governance is critical in ensuring water security. This study examines water sector governance and institutional framework's impact on service delivery. It employs a qualitative approach with Klang Valley, Selangor as the case study. Policy actors from federal and state governments are interviewed for primary data. Secondary data includes documents and archival records. Findings show that water service delivery was hampered by unclear jurisdiction, conflicting priorities, financial constraints, and lack of political will. Overcoming these challenges can be the basis for improving water service delivery system.

Keywords: water governance, institutional framework, service delivery, multi-level governments

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1.0 Introduction

Each year, 829,000 people die from diseases related to contaminated water, inadequate sanitation, and poor hygiene practices. By 2030, 1.6 billion people are predicted to face issues with safe drinking water. Three billion people's water quality is also unknown due to the lack of active monitoring of their water resources, which is necessary to prevent pollution. Ten percent of the global population (over 733 million people) live in countries with severe water stress. Water stress is exacerbated by decades of misuse, over-extraction,

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contamination, and poor governance (United Nations, 2022). Climate change, population increase, urbanisation, and pressure from agriculture, industry, and energy have driven water demand in recent decades (Shams, 2023).

Water disruptions due to pollution, pipe bursts, and maintenance have plagued Malaysia for years (The Edge, 2023). The latest Water and Sewerage Fact Book 2022, published by Suruhanjaya Perkhidmatan Air Negara (SPAN), stated that there were 43,956 cases of "Unscheduled" water supply interruption in Peninsular Malaysia and Federal Territory (F.T) Labuan for the year 2022. This number exceeds the "Scheduled" water interruption, projected at 1,935 cases (Table 1). From the statistics, Selangor, which includes Kuala Lumpur and Putrajaya in the Klang Valley, recorded 1030 cases of "Scheduled" and 10,518 cases of "Unscheduled" water interruptions. Earlier on, several incidents of water supply disruption occurred at the end of the year 2020. One incident triggered a massive shutdown of four water treatment plants at Sungai Selangor on 19 October 2020 due to suspected water source contamination (The Star, 2020; The New Straits Times, 2020). It has caused unscheduled water supply disruptions to more than 1.1 million consumer accounts, which has affected about 5 million individuals in the Klang Valley.

Table 1: Water Statistics 2022 (All States in Peninsular Malaysia and F.T Labuan)

Item	All states in Peninsular Malaysia and F.T Labuan	State of Selangor only
Population	26,789,700	9,103,700
Water consumption		
▪ Domestic	63.0%	62.3%
▪ Non-Domestic	37.0%	37.7%
Water Interruption		
▪ Scheduled	1,935	1,030
▪ Unscheduled	43,956	10,518
Complaints		
▪ Pipe breakage	38.5%	27.5%
▪ Billing & Meter	24.5%	42.2%
▪ Water interruption	17.1%	16.3%
▪ Others	13.0%	7.5%
▪ Water pressure	6.3%	6.0%
▪ Water quality	0.6%	0.4%

(Source: SPAN, 2022)

This study aims to explore the water service delivery issues in the Klang Valley by focusing on the institutional framework and governance of the sector. This objective corresponds to the many water governance discourses that imply "water crisis is a crisis of governance." It refers to the most challenging constraint in governance, namely the human component. The study highlights the need for an efficient service delivery system for uninterrupted water supply. Competent water governance is needed to solve complex issues and improve the water sector in Malaysia. The findings of this study can be used as the basis for improving the water service delivery system.

2.0 Literature Review

Water governance encompasses a complex political, social, economic, and administrative system that manages and provides water services across different societal levels (Studart et al., 2021). It is the decision-making interactions between stakeholders and institutions to manage water resources (Gumeta-Gomez et al., 2021). Water security involves ensuring reliable access to clean water for every person to live a healthy and productive life. Hence, improving water governance is critical considering the current urbanisation trend (Mishra et al., 2021). Effective water governance has become more crucial and strengthening institutional capacity in various areas is vital for improving governance (Yasin et al., 2021).

Water issues in Malaysia include river pollution, the safety of drinking water, and water disruption (Rahman, 2021). The current institutional framework of water governance in Malaysia is fragmented and lacks integration across sectors. The federal government is in charge of water supply and services while the state government is responsible for administering water resources. The local government is responsible for urban water management which, among others, involves the management of rainwater, wastewater, stormwater drainage, and run-off pollution (Abdullah et al., 2016). Due to this fragmentation, the country faces challenges in managing and monitoring water basins, especially enforcement of pollution control of the water sources (EPU, 2022). As a result, the polluted water source will then cause water disruption and deterioration of drinking water quality (Rahman, 2021) which has adverse impacts on people's quality of life (EPU, 2022).

Water sector reform in Malaysia started in 2003 when the federal government attempted to re-organise the water sector due to rising industry deficits (Tan, 2012). In 2006, the Malaysian Parliament amended the Ninth Schedule of the Federal Constitution. Subsequently, the Suruhanjaya Perkhidmatan Air Negara (SPAN), or the National Water Services Commission, was established. This national regulatory agency for the water sector draws its authority from Article 11(b) of the Federal Constitution. Water services are now shared between the States and the Federal Government under the Concurrent list, 9D of Article 95B (1) (b) under the purview of water supplies and services. New legislation was introduced, namely Water Services Industry Act and National Water Services Commission Act. The Water Service Industry Act 2006 [Act 655] and the National Water Services Commission Act [Act 654] govern the Malaysian water sector. The objective is to strengthen the role of the Federal government in state water governance and to make the water sector in the

country more efficient. This power distribution only applies to Peninsular Malaysia and F.T. Labuan. Sabah and Sarawak, the two states in East Malaysia located in Borneo, control and manage their water supplies and services (Saimy & Yusof, 2013).

Table 2: Water-Related Acts and Guidelines

No.	Acts	Description
1	Water Act 1920	Only applies to Negeri Sembilan, Pahang, Perak, Selangor, Melaka, Penang and the Federal Territory. The provisions cover the property of rivers, restoration, prohibition of diversions and pollution, licensing, penalties, and compensation. An Act to provide the control of rivers and streams
2	Water Supply Enactment (1955)	Empowers state water authorities in supplying water to domestic and commercial users. Only serves as a regulatory body to oversee the operations of the supply company and ensure compliance with drinking water standards. No legal power to enforce compliance from the companies or for them to initiate corrective actions.
3	Environmental Quality Act 1974	Prevent, abate, control of pollution, and enhancement of the environment.
4	Water Supply (Federal Territory of Kuala Lumpur), (Act 581)	Water supply and distribution of water in Selangor be applied to Kuala Lumpur with modifications.
5	National Water Services Commission Act (Act 654)	To transfer water supply services from the State List to the Concurrent List. Its vision is towards sustainable, reliable, and affordable water services for all. To regulate and supervise water supply and sewerage services, enforce water supply and sewerage services laws, and related matters.
6	Water Services Industry Act (Act 655)	To provide and regulate water supply services and sewerage services and incidental matters thereto.

(Source: Saimy & Yusof, 2013)

The governance and administration of water resources in Malaysia involve several ministries, departments, and agencies at the Federal level (Table 3). At the state level, water resource governance is the responsibility of respective State Governments. Water legislation is contained within the laws enforced by the various water-related government agencies and is focused on specific aspects of water resources under the respective agencies' jurisdiction. Gaps and overlaps exist. Conflicts in water resources management, such as allocation of water rights, flood management, pollution control, and environmental protection, are resolved through inter-agency coordination and consultation (Abdullah et al., 2016).

There are various acts used in Malaysia's water governance. However, the extensive water regulatory acts focus mainly on water supply and services, hence leaving the supervision of water resources further fragmented (Tan et al., 2020). The presence of too many agencies that have jurisdiction over different aspects of water resources management also led to confusion (Lee et al., 2018).

Table 3: Water-related agencies at the Federal level in Malaysia

No.	Agency	Responsibility
1	Ministry of Natural Resources, Environment and Climate Change	water policy matters
2	SPAN	regulatory matters
3	Ministry of Finance - PAAB (national water asset holding company)	assets ownership
4	state water companies	service provision
5	Department of Irrigation and Drainage (DID)	hydrology, river management, flood mitigation, coastal and stormwater management
6	Public Works Department (PWD)	domestic and industrial water supply
7	Department of Environment (DOE)	quality of rivers, reservoirs, or any water catchment areas
8	Ministry of Health (MOH)	quality of raw water supply especially for drinking water purposes

(Source: Lee et al., 2018)

3.0 Methodology

This study employed a qualitative research approach since it was exploratory. The researchers listened to the informants and built an understanding based on what was heard (Creswell, 2014). A case study design is employed because the researchers had little or no control over behavioral events and the focus of the study was a contemporary phenomenon. Moreover, a case study helped to develop an in-depth analysis of a case, advanced a field's knowledge base, and challenged current theoretical assumptions (Queiros et al., 2017). Klang Valley, located in the state of Selangor, Malaysia, was selected as the case study area due to its function as a national and regional growth centre.

This study used purposive sampling to enable the researchers to choose participants who are directly related to the main concepts of the study. The group of participants selected is relatively small and can change as more information is gathered. This method is particularly useful when studying complex subjects, prioritizing a thorough understanding over having a large and diverse group of participants (Dworkin, 2012). For the inclusion and exclusion criteria, this study included individuals who were directly involved in the water sector such as officers from government and private agencies. The informants had at least 3 years of experience in handling issues related to the water sector and could provide information based on the position and job scope. The study excludes individuals in the organisation who only performed administrative work without directly being involved in the water sector governance and who were also not in a position to make any decision.

Primary data is collected through semi-structured interviews with policy actors related to water governance at the federal and state governments. Secondary data consists of documentation and archival records. When interview appointments with the informants are made, the nature of the research is briefly explained. At the start of the interview, the interviewee is assured of confidentiality, and their consent is sought for the interview to be recorded. The interviews were conducted between February and June 2023. Seven key

informants from three agencies were interviewed: one Federal agency and two State agencies. These informants were marked as R1, R2, R3, R4, R5, R6 & R7 to ensure confidentiality. The responses collected from the interviews were transcribed and analysed manually. Thematic analysis was utilised in analysing the interview data. Information from archival records and documents was combined with information from the interviews. The findings result from the triangulation of information between all the data collection exercises.

4.0 Findings

The results of this study indicate that water service delivery in Klang Valley was hampered by unclear jurisdiction, conflicting priorities, financial constraints, and the absence of political will.

4.1 Unclear Jurisdiction

Following the Constitutional amendment, the water supply services and water resource management are placed under different levels of government. Water supply is under the Federal jurisdiction, while water resources management is under the State government. Various agencies, acts, and regulations in these two levels of government have created confusion and fragmentation in water governance. Loopholes appear in the enforcement due to unclear ownership and jurisdiction among the multiple agencies (Informant R4). The problem is further complicated by the fact that water governance is shared among multiple federal and state agencies and the local authorities and environmental agencies. This situation makes it challenging to pinpoint accountability, especially when curbing water pollution. Through the Local Government Act 1976 (Act 171), the local authority is empowered to take action against anyone who commits a nuisance or deposits any filth on or upon the bank of any stream, channel, public drain, or other water course. However, unclear jurisdiction and the absence of a single body to coordinate all the agencies for water supply services and water resources management have exacerbated the issues of ambiguous responsibility (Informant R4).

4.2 Conflicting Priorities

Conflicting priorities affect water service delivery. Due to multiple agencies in water governance, low priority was given to water resource preservation and quality maintenance (Informant R4). For instance, the agency that has the power to act against polluters gives low priority to enforcement as the impact of pollution does not affect its operations. Certain agencies also did not prioritise water resource preservation as it brings no direct benefit to them. Conflicting priorities also emerged in the maintenance of monitoring infrastructure. For example, a damaged bridge to the water monitoring area has been left unrepaired for several years, hindering access to the area for monitoring and enforcement purposes (Informant R4).

Water resource preservation is given the least attention compared to other sectors, defying the water-energy-food (WEF) nexus concept. For instance, it was mentioned that a water reserve area with a rich ecosystem could be lost to make way for an energy infrastructure development. Other prioritised developments, such as highway constructions, also contribute to pollution when water run-off and sediments enter the water resource. In addition, the food manufacturing industry and agriculture are usually preferred over water resource preservation for their importance in supplying food for the people. Once again, this act neglects the WEF nexus approach, which is to manage the interlinks between water, energy, and food.

4.3 Financial Constraints

Financial constraints heavily impacted water resource protection and service delivery. At the state level, water resource protection is hampered by institutional incapacity. The agency in charge of monitoring and protecting the water resource basin faces staff shortages due to a tight budget. This issue impedes the enforcement officers from effectively carrying out their duties. For instance, the state water regulator needs more staff to go to the field to act on reports on water pollution activities such as illegal dumping (Informant R4). Many of the personnel in the agency are hired on a contract basis, and lack of budget is said to be the reason for not appointing permanent staff or increasing the workforce.

Financial constraints have also heavily influenced water service delivery. It is reiterated that the overly low water tariff hampers the water operator's plans to improve service delivery (Informant R5, R6, and R7). The current rates are far from enough to cover the cost of water treatment and hamper the operator's objective of achieving full-cost recovery (Informant R5). Low water tariff creates a vicious cycle (Figure 1) which is unlikely to end until the water tariff issues are resolved.

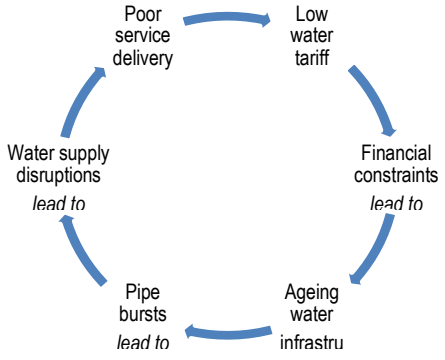

Fig. 1: Water Tariff Vicious Cycle

Pipe burst is the main problem that causes water disruptions other than water resource pollution (Informant R5). The incidents of pipe bursts could be avoided or reduced if the water operator has sufficient funding to replace the ageing water infrastructure. Ageing pipes replacement would also help to reduce the percentage of non-revenue water (NRW) and curb more losses on the operator's side. In short, an increase in water tariff would enable the water operator to achieve full-cost recovery and subsequently improve water service delivery (Informant R1, R2, and R5). After 16 years, the recent water tariff adjustment in the Klang Valley was implemented effective August 2022 for the non-domestic and special consumers categories only. However, for the domestic consumers, which amount to 62.3% of the water users, there has been no water tariff adjustment since 2006.

Water tariff has to be reviewed periodically to enable the water operator to fulfill its commitment to provide a safe and continuous water supply. After the State authority's endorsement, the operator will submit their tariff review proposal to the water supply regulator for review. Subsequently, the proposal will be submitted to the relevant ministry for approval before the proposed new tariff can be implemented. However, according to the informants (Informant R2 and R5), the proposal to increase the water tariff rate has always failed. There is no justification provided for the delay or rejection of the proposal.

4.4 The Absence of Political Will

The absence of a political will is identified as one of the reasons for the deteriorating water quality at the source (Informant R1, R4, and R5). This is likely due to politicians trying to avoid taking unpopular actions that risk their political mileage. Enforcement activities are often hampered by the absence of political will to act against the perpetrators. There are many cases of legal or illegal activities that cause water pollution at the source (Informant R4). Enforcing these activities seems to be a mammoth task since, more often than not, there is a lack of support from the political masters.

Political will is also necessary for achieving a competitive water tariff. Previous proposals to increase the tariff were hampered by the need for more political will to prioritise the continuous supply of good water quality on the main agenda. Public opinion on politicians trying to maintain the low water tariff seems more important than financing the agenda to improve the water system. Hence, politicians would remain in the status quo to save political mileage. As a result, the water operator continues to face financial constraints as the low tariff impedes their means to achieve full-cost recovery to improve the water service delivery (Informant R1 and R5).

5.0 Discussion

This study identifies four key challenges in Malaysia's water governance: unclear jurisdiction, conflicting priorities, financial constraints, and the absence of political will. Collectively, these challenges hinder effective water governance and service delivery. The findings also align with the literature highlighting the same issues. For example, Lee et al. (2018) highlighted that too many agencies have jurisdiction over different aspects of water resources management, either directly or indirectly. The current study's findings support this idea wherein unclear jurisdiction between multiple agencies is still an issue that has caused ownership ambiguity. Consequently, enforcement efforts are impeded, hindering effective management and leading to loopholes in addressing water-related issues, including pollution.

The primary weakness of Malaysia's water sector lies in the disconnect of governance, where the federal government is responsible for water supply and services while the state governments oversee water resources (Tan et al., 2020). Moreover, the water regulatory acts cover only the water supply and services, not water resources such as rivers, seas, or lakes, which may lead to poor water quality at the source. The various agencies responsible for water governance have also led to conflicting priorities. Preservation of water resources and water quality is often relegated to a lower priority status within certain agencies. This phenomenon is particularly concerning in instances where polluting activities do not directly impact the operations of regulatory bodies. The divergence of priorities also extends to infrastructural maintenance, where critical monitoring assets are neglected. Furthermore, conflicting priorities extend to larger development agendas, such as energy infrastructure and transportation. This results in the degradation of water resources due to the need for integration and consideration of the water-energy-food (WEF) nexus. The prioritization of food production and industrial sectors over water resource preservation contradicts the essence of this interconnected approach.

Another pressing issue is the financial constraints pervasive in water resource protection and service delivery. Inadequate funding hampers the capacity to protect water resources effectively. Staff shortages due to budgetary limitations compromise enforcement efforts and hinder swift responses to pollution incidents. Similarly, more revenue generation could improve the provision of water services. Insufficient revenue due to below-cost tariffs has also caused problems for the water sector (Tan et al., 2020). Low water tariffs disrupt the water operator's plans to improve service delivery and impede efforts to achieve full-cost recovery. The cyclical nature of the financial constraints and the reluctance to adjust water tariffs contribute to suboptimal water service delivery. The lack of funds for timely replacements exacerbates aging infrastructure and pipe bursts, causing interruptions and losses. In addition, the absence of periodic water tariff reviews hampers the water operator's commitment to ensuring a continuous water supply.

A strong political will and strict regulatory intervention could improve water governance and protect natural resources from depletion (Remali et al., 2017). Political will is a pivotal determinant in the deterioration of water quality at its source. The reluctance of politicians to take unpopular actions to preserve water quality has led to a lack of enforcement against polluters. Furthermore, more political support is needed to combat legal and illegal activities contributing to water pollution. Additionally, political inertia is seen in the resistance to adjusting water tariffs to sustainable levels. The prioritization of maintaining low water tariffs over improving water quality and service delivery reveals a need for more commitment to ensuring a reliable and safe water supply.

The findings outlined in this study underscore the need for a holistic and integrated approach to water governance. Addressing the highlighted issues is crucial as Malaysia aims to achieve the United Nations Sustainable Development Goals (SDGs), particularly Goal

6: Clean Water and Sanitation. The discussion on the institutional framework, water sector governance, and its implications on service delivery is highly relevant to SDG 6. Effective water governance is fundamental to achieving clean water and sanitation targets. A well-structured institutional framework and effective governance mechanisms will ensure proper allocation, protection, and sustainable use of water resources. Clear roles, accountability, and stakeholder coordination will contribute to efficient and effective water service delivery. In addition, effective enforcement plays a significant role in controlling water pollution. This is vital to achieving clean water targets, as polluted water sources harm human health and the environment. Furthermore, integrating water governance with other sectors, such as energy and food, will align with the SDGs' interconnected approach. This ensures sustainable use of resources and minimizes negative impacts, contributing to the overall goal of ensuring clean and accessible water resources. Finally, political will and leadership are crucial in improving the water sector. This is essential for driving policy changes, mobilizing resources, and prioritizing water services goals.

6.0 Conclusion & Recommendations

The aspects discussed concerning the institutional framework, governance, and service delivery in the water sector directly impact SDG 6, which emphasizes the importance of clean water and sanitation for sustainable development. Effective governance, proper resource management, and efficient service delivery are crucial for meeting the targets set under this goal and contributing to broader sustainable development efforts. By forging a comprehensive strategy, governments can establish a coherent regulatory framework that ensures sustainable water management, equitable service delivery, and the preservation of water resources for future generations. Further research should examine the effect of governance structure in a broader context and different dimensions.

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Paper Contribution to Related Field of Study

The findings could potentially serve as a basis for designing an efficient service delivery system to ensure the availability and sustainability of water resources for the current and future generations.

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