INSTITUTIONAL CHANGE AND PERFORMANCE ANALYSIS OF LOCAL GOVERNMENT-OWNED WATER SUPPLY COMPANIES IN WEST JAVA, INDONESIA

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ABSTRACT

Indonesia's city water supply companies (PDAMs) were facing challenges in achieving 100% coverage by 2024, a target set by the government. It was primarily due to institutional challenges within and between these entities. The government intervention in enhancing PDAM performance was not effective, because it was not driven by professional justifications. Despite government technical support, such as rehabilitating non-functional water systems, capacity building, and providing grants, these efforts have not significantly improved PDAMs' performance. This study investigated the influence of institutional changes on performance improvement in the (PDAMs). It examined multiple dimensions that affect the company's performance, including service provision, financial administration, technological procedures, and human resources development. The study included a review of the performance of PDAMs throughout Indonesia and by conducting a more in-depth study of PDAM Depok. Specifically, the performance of the 11 PDAMs participating in the NUWSP project was also studied, particularly in the completeness of the standard operating procedures that each PDAM had. The essential feature of this study method was that the researcher has been involved deeply in the technical assistance and capacity building of the PDAMs that participated in the project. The basic findings of this research were that PDAMs faced the challenges of maintaining and improving their services while addressing the needs of their customers, regulators, the environment, acquiring technologies, and institutional changes. Problems related to the performance of PDAMs always recur from time to time, and this recurring problem was the main challenge faced by the PDAMs. The recurring problems related to institutions that affected PDAM performance were related to institutional aspects, including regulative, normative, and cultural-cognitive. The recurring performance problems at the national level included low tariffs, PDAM financial management that tended not to improve, water quality, non-revenue water, and human resources development. This study found that the recurring problems of PDAM performance were caused by a combination of factors related to company performance institutional aspects, resource constraints, and lack of political will. The study also concluded that to strengthen performance, third-party involvement that is strong in operational issues is needed to enforce efficiency.

Keywords*:* Water supply, institutional changes, capacity building, performance

APPROVAL

This is to certify that this thesis conforms to acceptable standards of scholarly presentation and is fully adequate, in quality and scope, for the fulfillment of the requirements for the degree of Doctor of Philosophy.

The student has been supervised by: **Professor Dr Mohd Zambri Jaafar**

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This thesis was submitted to Asia e University and is accepted as fulfilment of the requirements for the degree of Doctor of Philosophy.

Professor Dr Siow Heng Loke
Asia e University
Chairman, Examination Committee
(8 March 2024)

DECLARATION

I hereby declare that the thesis submitted in fulfilment of the PhD degree is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that the material has not been submitted either in whole or in part, for a degree at this or any other university. In making this declaration, I understand and acknowledge any breaches in this declaration constitute academic misconduct, which may result in my expulsion from the program and/or exclusion from the award of the degree.

Name: Alizar Anwar

Signature of Candidate: **Date**: 8 March 2024

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
Akatirta	*Akademi Teknik Tirta Wiyata (Tirta Wiyata Polytechnic)*
APBN	*Anggaran Pembangunan dan Belanja Nasional* (National Budget)
Bappeda	*Badan Perencanaan Pembangunan Daerah* (Regional Development Planning)
Bappenas	*Badan Perencanaan Pembangunan Nasional* (National Development Planning Agency)
BJP	*Bukan Jaringan Perpipaan* (Non-pipe Water)
BPAM	*Badan Pengelola Air Minum* (Drinking Water Management Agency)
BPPSPAM	*Badan Pendukung Pengembangan Sistem Penyediaan Air Minum* (BPPSPAM) or the Supporting Agency for the Implementation of Drinking Water Supply Systems
BOT	Build-Operate-Transfer
BUMD	*Badan Usaha Milik Daerah* (LG-owned enterprise)
BUMDes	*Badan Usaha Milik Desa* (Village-owned enterprise)
BUMN	*Badan Usaha Milik Nasional* (Central Government-owned Enterprise)
Dit AM	*Direktorat Air Minum (Directorate of Water Supply)*
DPRD	*Dewan Perwakilan Rakyat Daerah* (Local Parliament)
FRAP	Financial Recovery Action Plan
HC	House Connection

HRD	Human Resources Development
IPA	*Instalasi Pengolahan Air* (Water Treatment Plant)
ITB	*Institut Teknologi Bandung* (Bandung Institute of Technology)
Jakstrada SPAM	*Kebijaksanaan dan Strategi Daerah Sarana Penyediaan Air Minum* (Regional Policy and Strategy of Water Supply Development System)
Kemendagri	*Kementerian Dalam Negeri* (Ministry of Home Affairs)
PUPR	*Kementerian Pekerjaan Umum dan Perumahan Rakyat* (The Ministry of Public Works and Housing)
LG	Local Government
lps	liter per second
MDGs	Millennium Development Goals
MPW	Ministry of Public Works
NAWASIS	National Water and Sanitation Information Services
NGOs	Non-government Organizations
NRW	Non-revenue Water
NSGC	Norms, Standards, Guidelines, and Criteria
NUWAS	National Urban Water Supply
NUWSP	National Urban Water Supply Project
PAD	*Pendapatan Asli Daerah* (Genuine Regional Income)
PDAM	*Perusahaan Daerah Air Minum* (Local government-owned water utility). PDAM was used as general term to name water supply company at regional level
Pemda	*Pemerintah Daerah* (Local Government)

PP	*Peraturan Pemerintah* (Government Regulation)
PPP	Public Private Partnership
Repelita	*Rencana Pembangunan Lima Tahun* (Five-Year Devcelopment Plan)
RoE	Return on Equity
RPJMN	*Rencana Pembangunan Jangka Menengah Nasional* (National Medium-term Plan)
RPJMN/D	*Rencana Pembangunan Jangka Menengah Nasional/Daerah* (National/Regional Medium-term Plan)
RQ	Research Question
SDGs	Sustainable Development Goals
SPAM	*Sistem Penyediaan Air Minum* (Water Supply System)
UN	United Nations
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

1.0 Overview

This study was about investigating the dynamics of institutional changes that had effects on the performance of the local government's public water utility services PDAM (*Perusahaan Daerah Air Minum*, a local government-owned company in water supply provision) in Indonesia. The study aims at identifying institutional dynamics that had effects on the organization of water supply, and that can further impact the performance of their services. The conceptual framework used to analyse this study was derived from the theory of institution. This theory explains three levels of analysis. First, the relationship between institutions and actors. Second, the institutional change, and third, the dynamics of change within that relationship and its impact on the water utility performance.

This study adopted a qualitative method approach, conducted in PDAM which involve in the development of water utility service. The investigation aimed at understanding the relationship between the institutions and actors that influenced the utility development, and to find out their relationship that can contribute to the improvement of the PDAM performance.

1.1 Background of the Study and Research Gaps

Indonesia is a vast country with a population of 270,625,568. Fifty-six percent of its population lives in urban areas (Index Mundi, 2021). By law, it was the obligation of the government to provide water for domestic use to its population. Local governments have a responsibility to provide water to their communities to sustain satisfaction (WHO, 2001). The governments at national and local levels allocated budgets annually

to support the development of the water supply service. In urban areas, the water was distributed through piped systems, operated by PDAMs, established in every local government. Notwithstanding the government's supports, the water service was not adequate to fulfil the needs of the communities (Bappenas, 2020). The number of the PDAMs has been increasing, from 285 in 1987 to 387 in 2020 (ADB, 1990; BPPSPAM, 2019).

The following Table 1.1 showed the state of PDAM operations nationally in the 2019-2022 period.

Table 1.1: PDAMs operation in Indonesia, 2018-2022

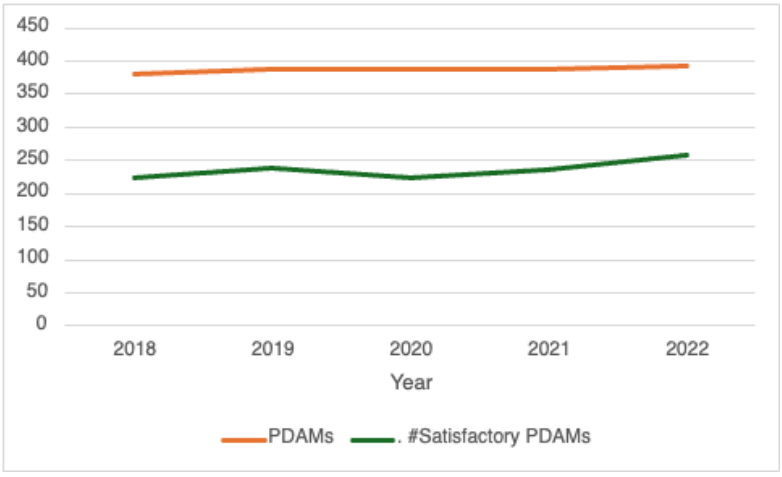
Year	2019	2020	2021	2022
# Municipalities	514	514	514	514
#PDAMs	387	388	389	393
. #Satisfactory PDAMs	239	225	237	257
. #Unsatisfactory PDAMs	148	163	152	136
#RISPAM	320	284	293	323
#Buss Plan	303	306	328	329
#Population in service areas	179.239.242	191.761.083	197.568.786	207.852.924
#Population served	54.945.109	55.322.313	56.142.857	56.566.185
Installed capacity, lps	218.234	223.406	229521	237.891
Production real, lps	159.406	163.949	168.438	173.098
NRW, %	32,67	33,24	33,72	33,90
FCR, %	37,47	36,86	37,79	42,49
Tariff average, Rp/m3	5.297	5.284	5.374	5.609
Production cost, Rp/m3	5.070	5.097	5.194	5.381
#House Connections	13.380.180	14.079.092	14.698.047	15.324.322

The table above showed the state of business operations of PDAMs in Indonesia in the 2019 – 2022 period. Issues concerned with PDAMs operation were lack of long-term drinking water service plans and business plans, low levels of service

coverage, high water loss, and low percentage that achieved full cost recovery. Specifically, the problems faced in developing drinking water services were as follows:

There were still many PDAMs that were unable to provide adequate services. In the 2014-2019 RPJMN, the Government targeted all PDAMs to operate satisfactorily, but in reality, in 2019 there was still a large gap between target and achievement. Of the 387 PDAMs monitored, there were 239 PDAMs whose performance was satisfactory, while the other 148 PDAMs were operating in unsatisfactory conditions. The following **Figure 1.1** illustrated the number of PDAMs that were not yet operating in satisfactory status.

Figure 1.1: PDAMs in Indonesia that operated satisfactorily



The government's target service coverage was 30% in 2024, the achievement in 2022 was 21.2%, far below the target. **Figure 1.2** below illustrated the existing gap between target and realization which always appeared repeatedly during the 2018-2022 period.

Non-revenue water (NRW) was targeted to become 25% in 2024, but this was not achieved because throughout the 2018-2022 period, this figure was above 32%.

Figure 1.3 depicted the NRW performance which recurred every year during this period.

Figure 1.2: Population served by piped water

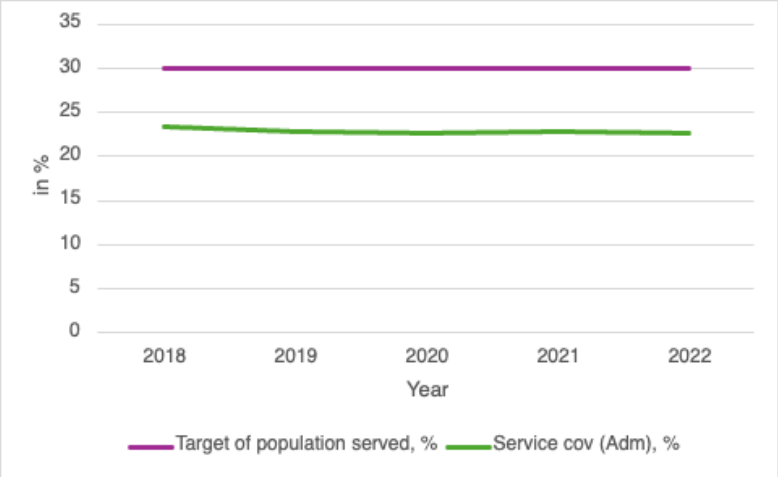
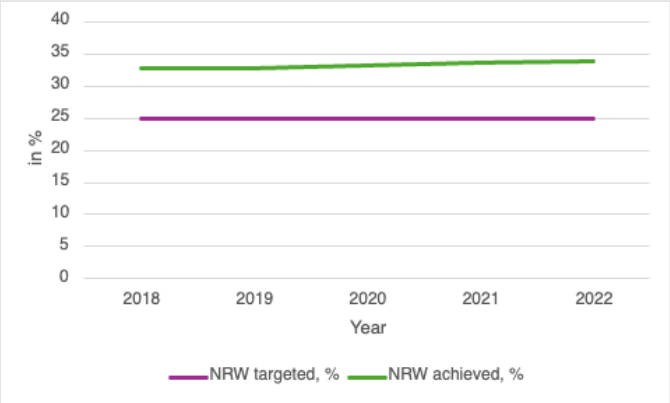


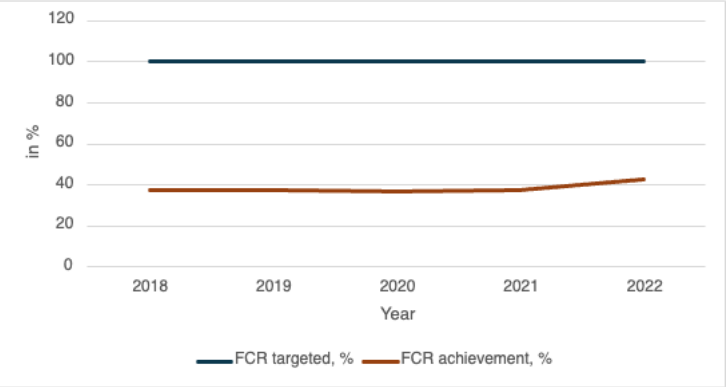
Figure 1.3: Non-revenue water performance, national average



Likewise, concerned with the financial aspect, the target was that in 2024 all PDAMs will earn benefit from managing the drinking water business, however this was far from expectations; in 2022 only 42.5% of PDAMs throughout Indonesia that achieved full cost recovery (FCR) financial status. PDAM's failure to achieve FCR status in its operations always recurred during the 2018-2022 period. **Figure 1.4** below showed the status of FCR achievement in the period of 2018-2022.

The research gaps were drawn from studying previous literature in water utility performance improvement. Based on the literature review, several gaps were identified as to why this research was needed. First, the literature review conducted on water utility performance showed that water utility performance researches were focused on knowledge and skill development, and less on regulative and normative aspects. The researches were also compartmentalized. For capacity building of an organization to succeed, three factors that built an institution should be considered, i.e., regulative, normative, and cultural cognitive (Scott, 2014).

Figure 1.4: Full cost recovery achievement of PDAMs



Second, the research mostly focused on PDAM organization, whereas water utility development involved government institutions at central and local levels. The role of local government institutions in formulating policies and regulations was strategic to the water supply development (Bierling, 2019).

Third, the subjects studied in the previous research were not comprehensive, they were compartmentalized by focusing the research mainly on one element of the institutional factors.

Fourth, observing that much of the previous research on an organization's performance was using quantitative methods, this research will use a qualitative method to understand deeply how the subject was viewed and to find how the

institutional factors affect the organizational performance practices. It involved systematically categorizing data to identify recurring themes or patterns that emerged from the data. This thematic analysis allowed the researcher to gain a deeper understanding of the underlying meanings, experiences, and perspectives with the data.

1.2 Recurring Challenges in Water Supply Development

A review of past reports, from 1990 to 2021, revealed that the water supply in Indonesia has suffered from chronic problems, stretching from institutional, financial, managerial, and technical difficulties. These challenges caused institutional weaknesses (Bierling, 2019; The World Bank, 2021) and poor accountability, (ADB, 1990; The World Bank, 2021). Among the problems, five were described below.

1.2.1 Financial Aspect

Many of the water tariffs were low, hence limiting the revenue of the PDAMs and posed PDAMs with the deficit (ADB, 1990; Locussol, 1997), the tariffs were below full cost recovery price (Bappenas, 2019; The World Bank, 2012). This situation had led the PDAMs into a situation of deficit, and as a consequence required subsidy to operate.

1.2.2 Service to Consumers

Unsatisfactory service to consumers was due to, among other, intermittent supply, poor quality, and low water pressure (ADB, 1990; Bappenas, 2009, 2020; Locussol, 1997; The World Bank, 2012). Non-revenue water was high, 40-45% in 1990s (ADB, 1990); 33.3% in 2000s (Bappenas, 2009); 33.6% in 2017 (Bierling, 2019); and 33% in 2019 (Bappenas, 2019). High NRW relates to poor operation and maintenance of the water systems (The World Bank, 2012).

1.2.3 Operation and Maintenance

Operation and maintenance of the water system were reported insufficient to retain the service life of the assets (ADB, 1990; Bappenas, 2009); poor operation and maintenance have caused rapid damage to the water system, and that has shortened the lifetime of the assets (The World Bank, 2012).

1.2.4 Human Resources

The low capacity of human resources has been reported throughout the decades persistently. Low capacity of human resources has been found in all aspects of water development from planning, designing, construction, and operation & maintenance and management of the water utility system (ADB, 1990; Bappenas, 2020; BPPSPAM, 2010; Locussol, 1997).

1.2.5 Institutional Aspect

Weak coordination among local agencies regarding water supply development was reported in various documents published during 1990 and 2019 (ADB, 1990), lack of interdepartmental coordination (Bappenas, 2009, 2019; The World Bank, 2012). The policy change from centralization to decentralization in 2001 has also affected the management of the PDAM (The World Bank, 2012).

In general, the issues described above indicated problems confronted by water supply improvement from 1990 to 2021. The problems have recurred in every period despite improvement initiated by the government in 5-year medium-term development schemes. With a decentralization policy starting in 2001, the central government has not been involved in the direct implementation of water projects and has transformed its role as an enabler of water development conducted by local governments (The World Bank, 2012).

The five problems that were indicated that appeared recurrently in the water supply development that were relevant to this study, were summarized in **Table 1.2**.

1.3 Water Utility Performance

Monitoring the performance of the PDAMs during the 2015-2021 (Dit AM, 2022) results was shown in **Table 1.2**. The Table showed the conditions of the PDAMs during 2015-2021, based on their categories.

Table 1.2: Five factors recurring in PDAMs operation

Factor	Issues
Financial	Low financial accountability, low tariff. financial deficit, operated on subsidy status.
Service to consumers	Low service accountability, intermittent supply, low pressure, high non-revenue water.
Operation and maintenance	Low operational accountability, Poor operation and maintenance, rapid damage of water supply system's assets.
Human resources capacity	Low human resources capacity, lack of skills.
Institutional	Weak institutional aspects (regulative, normative, cognitive) in the water system.

The PDAMs performances were reviewed by analysing the utility achievements, by monitoring and evaluating their financial, service, operational, and human resources performance (BPPSPAM, 2019). Their performances were categorized into three groups: satisfactory, less satisfactory, and unsatisfactory. This grouping category was derived from the measurement of four performance indicators, financial, services, operations, and human resources factors (BPPSPAM, 2015). For the purpose of this research, the grouping was simplified into two, satisfactory and not satisfactory in which the latter consisted of less satisfactory and unsatisfactory combined.