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## **Groundwater Tax as Alternative Financing for Public Water Services: The Case of Jakarta**

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### **ABSTRACT**

The involvement of private sector in Jakarta water services was first seriously questioned in December 2011, when the President Director of PAM Jaya, the state-owned water utility, claimed that the utility would accumulate a financial loss as much as US\$1.82 billion caused by the cooperation agreement with the private operators. It led to a long process of contract renegotiation between PAM Jaya and the private operators, until finally in March 27, 2013, the governor of Jakarta stated that the government would take over water services from private operators. This paper is written amid this transition, and aimed at anticipating Jakarta's post-privatization water services. One of the main challenges of the public water utility will be to provide sufficient fund for expanding the water services.

Groundwater tax as alternative financing is offered by this paper because groundwater management and piped water supply are closely related. Jakarta is facing excessive groundwater exploitation that has caused severe environmental impacts such as land subsidence and saltwater intrusion. However, the effort to reduce groundwater exploitation has so far been unsuccessful, mainly because groundwater users barely have other options of water supply. The piped water services, where the groundwater users are expected to switch to, are still low in performance. They do not cover roughly half of the population and are unreliable both in quality and quantity.

Therefore, allocating groundwater tax revenue for financing piped water services is a measure to achieve two objectives at the same time, which are to improve the public water services and to reduce groundwater exploitation. Revenue from groundwater tax can give significant contribution for the public water investment. In terms of

regulation, there is precedence in another district where groundwater tax revenue is allocated for certain purposes. The method for this measure will be through government financial assistance, a common practice where the government financially supports state-owned companies.

## A. INTRODUCTION

There are two problems of water supply in Jakarta that are closely related but managed separately, namely excessive groundwater exploitation and poor piped water services. Groundwater management is the responsibility of Jakarta Environmental Management Body (BPLHD), while piped water services are the responsibility of Jakarta Drinking Water Company (PT PAM Jaya), a state-owned water utility. These institutions are not coordinated regardless the two problems are in fact in causal relationships.

Groundwater is the main clean water supply in Jakarta. BPLHD recorded that groundwater use for commercial purposes in 2011 is 7.86 million m<sup>3</sup>, but Amrta Institute estimated the total amount could be up to 99.68 million m<sup>3</sup>. As the environmental impacts of groundwater exploitation worsened, in 2009 BPLHD set groundwater tax rate in an immense hike as a disincentive for groundwater users. They were expected to switch to piped water services. However, illegal groundwater extractions increased instead.

Groundwater users are reluctant to switch because the piped water services are not only expensive but also unreliable. Water services in Jakarta have been privatized since 1998 through a concession with two private companies, Lyonnaise des Eaux (now Palyja) and Thames Water (now Aetra). The private operators' financing strategy has caused several times of tariff hikes, making it sharply the highest among other big cities in Indonesia, while the performance keeps unsatisfactory. The connection only covers half of the population, and customers complain about the water availability from time to time. Water from pipes is often dirty and water related health issues are reported.

This paper is aimed at offering a financing strategy that addresses both of the problems. In order to reduce the level of groundwater exploitation, the piped water services need to be improved. On the other hand, the piped water services, which are now currently being taken over by the government from the private operators, could use the fund from groundwater tax revenue for investment.

This paper is divided into three main parts. First part will discuss the current water services in Jakarta. It includes current service performance to demonstrate why it needs to be improved, current financing under private operators and an argument why it needs to be changed, and an estimation of the needed investment. The method for this estimation is by using rough data, such as population number, the

average of water needs, and estimated cost for improving the water services, to be used as far as demonstrating in what range the required investment will be. The currency conversion from Indonesian Rupiah to US Dollar is assumed at IDR 10,000/US\$1.

The second part will discuss the groundwater side. It includes the discussion about current amount of groundwater tax revenue and its potential revenue if managed optimally. The last part will discuss about the implementation of this strategy.

## 2. THE WATER SERVICES

### 2.1. Current Performance

Jakarta Water Regulatory Body (JWRB) is an institution founded for facilitating the cooperation agreement between the public water utility with private operators. One of its main tasks is to evaluate the performance of piped water services in Jakarta. In 2008, it publishes the first accessible evaluation of the ten years of Jakarta water privatization.

According to JWRB (Lanti et al 2008), the private operators had failed to meet several targets. The private operators failed significantly in service coverage ratio, which is the service coverage compared to the population. Two operators were only able to improve the service coverage ratio to 62.21% from the target of 74.55% stated in the cooperation agreement. Not only did the number fail to meet the target, JWRB also believes that it is unrealistic due to obsolete parameters the private operators use. According to JWRB, the more realistic coverage ratio would be 42.92% (Lanti et al, 2008: 126). It means more than half of the population doesn't have access to piped water services.

The most current data on service coverage ratio is provided by Perpamsi (drinking water utility association), while the private operators do not display their service coverage ratio among the achievements they endorse on their websites. According to Perpamsi, both operators' service coverage ratio in 2010 is still in the level of 63.93%<sup>1</sup> for Palyja and 65%<sup>2</sup> for Aetra.

With this unsatisfactory performance, Jakarta water tariff is the highest among that of other big cities in Indonesia. It raises questions about the water tariff's affordability especially for the poor.

Table 1: Jakarta water tariff compared with other big cities in Indonesia (2012)

	City	Tariff (per m3)
1	Jakarta	IDR 7,020 (US\$0.7)
2	Surabaya	IDR 2,600 (US\$0.3)
3	Medan	IDR 2,294 (US\$0.2)
4	Bekasi	IDR 2,300 (US\$0.2)

5	Makassar	IDR 2,000 (US\$0.3)
6	Semarang	IDR 2,600 (US\$0.3)

Source: (1), (2), (4) TribunNews (31/01/2012); (3) Bisnis Indonesia (24/09/2012); (5) Department of Public Works; (6) Okezone (10/05/2012)

Aside from the figures, customers often complain about the water services they have.<sup>3</sup> Customers even testified before the judges of citizen lawsuit that is currently ongoing about the poor water services. The complains about water service can be found in South Jakarta, West Jakarta, East Jakarta, Central Jakarta, and especially in the poorest area in North Jakarta.

Most of complains is about water availability. Customers often find their tap empty. It can last for hours and even for days. Despite the lack of availability, customers still have to pay monthly bills for subscription fee and the accidental water meter spinning caused by elapsing pressured air when they try to check the water availability. This situation has driven customers to request for disconnection but is hardly followed up by water operators. It is most likely because the water operators need to keep the performance figures high.

Water quality is also often complained. Customers do not trust the water quality for consumption even if it is boiled. BPS (Indonesia Statistics) shows that only 24.18% of population use piped water for drinking water (BPS in Lako and Ardhanie 2010, p. 2). They use bottled water instead, adding more expenses for clean water. There is even a case of piped water related health issues reported in Cilincing, North Jakarta, where 500 families sent a letter to legislative council regarding the case of skin irritation and diarrhea because of the dirty piped water.<sup>4</sup>

## 2.2. Current Financing

As pointed out by Lako and Ardhanie (2010), the private operators' financing strategy is by selling bonds and seeking loan from creditors. This chosen financing strategy, instead of by shareholders capital contribution, is in fact much expected since the water privatization also began with the World Bank's support of US\$92 million for infrastructure improvement in 1991, "to make the waterworks a more attractive investment" (Harsono in Ellison ed 2003, p. 71).

The private operators keep seeking loan, and another loan to pay the prior loan. In 1998, the private operators secured a loan from European Investment Bank. In order to pay this loan, Palyja sold bonds that were worth IDR 650 billion (US\$65 million) in 2005 due in July 2012. According to the financial report, Palyja uses the bonds to pay the loan.

In 2008, Palyja also obtained a loan from Asian Development Bank of IDR 455 billion (US\$50 million). However, the financial report again shows that this loan is not used for investment and operations. Rather, the fund from ADB of IDR 120 billion (US\$12

million) is used for paying bonds of IDR 175 billion (US\$17.5 million) that is due in July 2008.

The financing strategy through loans and obligations increases costs as the interests are always accumulating. In turn, it causes decrease in profit. To prevent this, the private operators use water tariff to maintain their business profit. An exemplary case was when after they sold bonds in 2005, the water tariff was increased for the next three years until 2007.

In other words, the private operators tend to divert the business costs to customers while the shareholders enjoy guaranteed financial profit. The profit is also guaranteed high. In the cooperation agreement, the shareholders are given an Internal Rate of Return (IRR) of 22%. IRR is “the average amount of money earned each year from a particular investment, calculated by comparing how much money it makes each year with the original amount invested”.<sup>5</sup> The IRR is considered too high. JWRB recommends the reasonable IRR should be at 18%. Financial and Development Supervisory Body (BPKP) recommends 14.68%.<sup>6</sup>

According to Lako and Ardhianie (2010), the private operators choose the financing strategy through loans and bonds for several reasons; first, it will keep the IRR high; second, the private operators’ core business is basically monopoly and they are enabled to do so; third, it creates financial distress, where the private operators are constantly in liquidity crisis, which can legitimate the urgency of water tariff hikes.

This very financing system has caused not only tariff hikes but also tremendous financial loss for PAM Jaya. As stated by the president director of the state-owned water utility, it had so far accumulated IDR 561.41 billion (US\$56.14 million). Furthermore, if the financing system is continued until it ends in 2013, the water utility will bear financial loss as much as IDR 18.2 trillion (US\$1.82 billion).<sup>7</sup>

### 2.3. Needed Investment

The estimation of the needed investment in this paper uses clean water supply and demand approach. With this approach, the average individual water need is multiplied with population number. The result will be compared with the current water supply available in Jakarta, namely piped water services and groundwater use in the safe limit.

Jakarta population growth is calculated until 2017, in order to estimate the water need and the needed investment in the year. Year 2017 is chosen because it will be the last year of the current governorate period. It is important for the current governor to prove that the efforts to improve water services are successful.

Table 2: Jakarta population growth estimation

NO	Population	2011	2012	2013	2014	2015	2016	2017
1	Citizens	9,741,992	9,991,788	10,191,624	10,395,456	10,603,365	10,815,433	11,031,741
2	Commuters	2,928,597	2,997,536	3,057,487	3,118,636	3,181,009	3,244,629	3,309,522

Note:

- Citizen number increases 2% each year
- Commuter number increases 2% each year

Source: Jakarta dalam Angka, BPS (2012)

With the population growth demonstrated in the table, Jakarta's population in 2017 is estimated to be 11.032 million. With the assumptions from JWRB (2009) that each individual's need to water is approximately 175 liter/day, and the commercial sector's need to water is approximately 30% of the total domestic use, the total clean water needs in Jakarta can be calculated as below:

Table 3: Estimated water needs (2017)

No.	Water needs	Total (m3/year)
1.	Domestic water needs: population x individual water need: 11,031,741 persons x 175 liter/person/day	704,652,477 m3/year
2.	Industrial water needs: 30% x total domestic needs: 30% x 704,652,477 m3/day	211,395,743 m3/year
3.	Commuter water needs: (60% x 175 liter/day) x total commuter: 105 liter/day x 3,309,522	126.837.429 m3/year
Total water needs: domestic needs + commercial needs + commuters needs		
<b>Annual water needs in 2017</b>		<b>1.042.885.649 m3</b>

Note: commuter water needs are estimated 60% of the citizen water needs.

Table 4: Clean water supply in Jakarta (2011)

No.	Clean water sources	Total (m3/year)
1.	Piped water services: 527,854,123 m3 – 158,356,237 m3 (30% leakage x 527,854,123m3=158,356,237 m3)	369,497,886 m3
2.	Groundwater (safe limit)	256,000,000 m3
<b>Total of clean water supply</b>		<b>652,497,886 m3</b>

Source: Amrta Institute & Tifa Foundation Research Report 2013

Therefore, estimated clean water deficit in 2017:

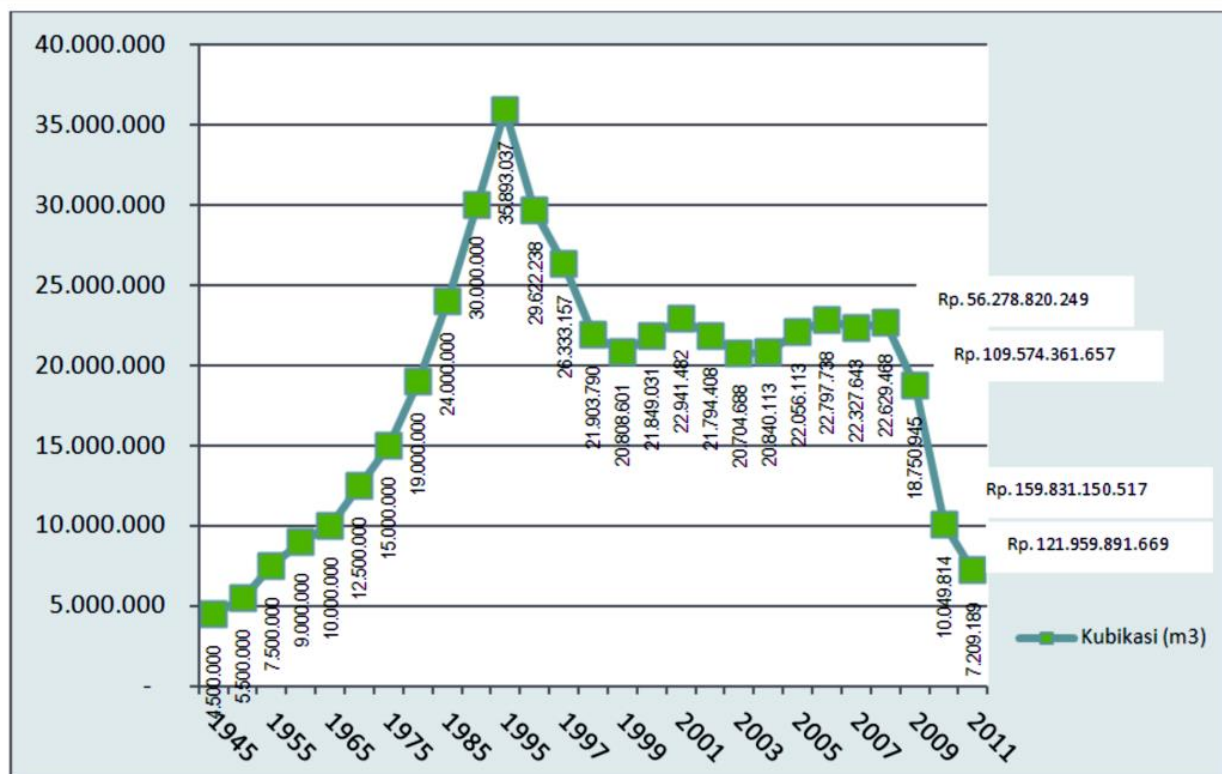
Estimated water needs – water supply = **390,387,763 m3/year**

In order to improve the water supply, the necessary measures are to increase the bulk and treated water supply, increase water production, and reduce the leakage. In addition, the water utility needs to build new water treatment plants, maintain and optimize the available water treatment plants, and fix the water networks. Until 2017, the efforts to provide clean water supply for Jakarta will need at least IDR 7 trillion (US\$700 million).

### 3. REVENUE FROM GROUNDWATER TAX

According to Government Regulation Number 43 Year 2008, groundwater users for commercial purposes are subject to groundwater tax. Based on this regulation, BPLHD only records groundwater exploitation done for the commercial purposes. Groundwater use shown in the graph below, thus, does not include the groundwater use for domestic purposes.

Figure 1: Groundwater exploitation for commercial purposes



Source: BPLHD

In 2011, groundwater exploitation of 7.2 million m3 generated revenue of IDR 121.96 billion (US\$12.2 million). The sharp decline of groundwater use in 2009 is caused by the implementation of Governor's Decree No. 4554/1999 that increases the groundwater tax rate. The main objective of this rate hikes is for reducing groundwater exploitation. However, as in the same year the piped water services'

capacity only slightly improved, the decline is most likely caused by illegal extractions.

Even with the current trend of revenue, groundwater tax will significantly support the piped water services' investment needs. If the groundwater tax revenue is assumed being steady at US\$12.2 million for five years, the accumulated fund will be US\$60 billion, or higher than the loan Palyja secured from ADB, which was US\$50 billion in 5 years term.

Furthermore, if the government optimally manages groundwater resources, which can reduce illegal extractions, the potential revenue from groundwater taxes will be significantly higher:

Table 6: Estimated potential revenue of groundwater tax (2011)

	<b>Groundwater use recorded</b>	<b>Estimated real groundwater use</b>
	<b>7.2 million m3</b>	Population: $9.741.992 \times 175$ liter/day = 622,269,739 m3  Industrial groundwater use (taxable): $622,269,739 \text{ m}^3 \times 30\%$ = 186,680,921 m3  Covered by piped water services: 87 million m3  Unrecorded groundwater use: = <b>92.48 million m3</b>
Groundwater tax revenue	IDR 121 billion ( <b>US\$12.1 million</b> )	* If the unrecorded use is from big and medium industry: IDR 1,403 billion ( <b>US\$140 million</b> ) If the unrecorded use is from medium and small industry: IDR 702 billion ( <b>US\$70 million</b> )

Source: \*) interview with BPLHD

The revenue from groundwater tax is prioritized first for programs related with groundwater, such as conservation, groundwater control and management improvement, and studies related with groundwater. A certain percentage of the revenue is then invested in piped water services improvement. In this paper, the percentage is assumed 50%.

The first scenario, if the unrecorded groundwater use is from medium and small industry, the potential revenue from groundwater tax that can be allocated for piped water services improvement will be:



$(\text{US\$}70 \text{ million} + \text{US\$}12.1 \text{ million}) \times 50\% = \text{US\$}41.05 \text{ million}$

If for five years the estimated groundwater tax revenue is steady, there will be US\$205.25 million of fund that can be invested in piped water services, or roughly 30% of the needed investment.

The second scenario, if the unrecorded groundwater use is from big and medium industry, the potential revenue from groundwater tax that can be allocated for piped water services will be:

$(\text{US\$}140 \text{ million} + \text{US\$}12.1 \text{ million}) \times 50\% = \text{US\$}76.05 \text{ million}$

If for five years the estimated groundwater tax revenue is steady, there will be US\$380.25 million of fund that can be invested in piped water services, or roughly 55% of the needed investment.

## 4. IMPLEMENTATION

### 4.1. The Problem with Centralized Budget

According to Act No. 28 Year 2009, groundwater tax is a municipal tax and becomes municipal revenue. As a consequence, the revenue from groundwater tax is collected together with revenues from other sectors. Once groundwater tax revenue is collected by municipal government, basically there is no means to secure the revenue for certain purposes, even if it is for groundwater purposes such as conservation.

However, there is precedence in Sukabumi (a municipality 100 km south of Jakarta) that has tried to solve the problem of centralized budget. Sukabumi municipal government issued a regulation Number 14 Year 2010, requiring 20% of groundwater tax revenue to be spent for activities related with groundwater management, such as research and conservation. Jakarta can adopt this regulation to allocate revenue from groundwater tax for piped water services.

### 4.2. Institutions

To implement this financing strategy, it is not necessary to found an ad-hoc institution. The institutions involved are only PAM Jaya and BPLHD. As this financing strategy only needs to transfer groundwater tax revenue to PAM Jaya, both institutions do not have to be connected in a major coordination.

PAM Jaya and BPLHD have in fact cooperated for several occasions, which can ease the future coordination if the financing strategy is implemented. PAM Jaya and BPLHD, for example, in 2011 made a joint investigation to find out the leakage of

water supply in both institutions. This is an effective investigation to reveal that many groundwater users and piped water services customers manipulate the water meter in order to avoid paying the bills and/or groundwater tax. Both institutions have been aware that they are closely related and need to work together.

#### 4.3. Method

The method to allocate groundwater tax revenue to piped water services investment will be through government capital assistance. In this method, the government gives investment for state-owned companies. In 2012, for example, the government of Jakarta provided capital assistance for developing public transportation (Mass Rapid Transit) with the amount of fund IDR 968.5 trillion (US\$96.9 billion).<sup>8</sup> In this case, the government will invest in PAM Jaya, which is a state-owned company, for improving the water services.

In fact, the government of Jakarta also used this method in executing its plan to purchase the shares from private water operators. It is using relocated fund from several institutions to support financially two state-owned companies named PT Jakarta Propertindo and PT Pembangunan Jaya to purchase Palyja's shares.<sup>9</sup> Government capital investment is a common practice and, especially in Jakarta, all the regulations to conduct it are already in place.

## 5. CONCLUSIONS

Groundwater tax revenue is a considerable fund that can be optimally used for improving piped water services in Jakarta. The current amount of groundwater tax revenue equals the amount of loans the private operators secure from creditors and development banks. Its potential income is sufficient to cover up to more than half of the needed investment to improve the water services. In addition, it can avoid the disadvantages of financing through bonds and loans that so far has been responsible for the tariff hikes and the public water utility's tremendous financial loss.

The implementation of this cross public institutions financing strategy will also mutually benefit the groundwater resources and piped water services. The public water utility will be able to provide a reliable and affordable water services. At the same time, groundwater exploitation will be reduced as the groundwater users have a better option of water supply.

Regarding the problem of centralized budget, Jakarta can adopt a preceding regulation from another municipality that allocates revenue from groundwater tax for water-related spending. In terms of formal mechanism, the financing strategy can be conducted through government capital assistance. This financing strategy is a feasible measure and can be efficiently implemented.

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## ENDNOTES

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<sup>1</sup> <http://perpamsi.or.id/pdam-members/read/103/pt-pam-lyonnaise-jaya.html>

<sup>2</sup> <http://perpamsi.or.id/pdam-members/read/564/pt-aetra-air-jakarta.html>

<sup>3</sup> Also recorded as documentaries by Amrta Institute: *Through the Empty Tap* (2011) and *Subscribing to Dry Pipes* (2013)

<sup>4</sup> <http://www.thejakartaglobe.com/archive/cilincing-residents-blame-dirty-tap-water-for-spate-of-health-problems/>

<sup>5</sup> <http://dictionary.cambridge.org/dictionary/business-english/internal-rate-of-return>

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<sup>6</sup> [http://www.beritajakarta.com/V\\_Ind/berita\\_print.asp?nnewsid=34145](http://www.beritajakarta.com/V_Ind/berita_print.asp?nnewsid=34145)

<sup>7</sup> The President Director of PAM Jaya's presentation in Amrta Institute's discussion "Refleksi 13 Tahun Swastanisasi Layanan Air Jakarta", Jakarta June 30, 2011

<sup>8</sup> Governor Decree Number 1525/2012

<sup>9</sup> <http://www.tempo.co/read/news/2013/06/22/083490317/Pemda-DKI-Mau-Beli-Saham-Suez-di-PAM-Jaya>

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