Tropentag 2009
University of Hamburg, October 6-8, 2009
Conference on Biophysical and Socio-economic Frame Conditions for the Sustainable Management of Natural Resources

Problems and Critics toward Water Management in Megacities: A Case in Indonesia

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Introduction

The United Nations has defined a megacity as having more than 10 million people. According to this definition, in 1950 the world had only one megacity; the number is increasing ever since: 5 in 1975, 16 in 2000, and it is expected to reach 21 by the year 2015 (UN, 2002). In year 2000, 12 out of 16 megacities were located in developing countries. Generally, most of the megacities are facing water scarcity, financial and management constraints, as well as environmental problems. In this case, Jakarta, the capital city of Indonesia, is not an exception.

With an area of 662 km^2, Jakarta is currently inhabited by around 13 million people or 19,600 people/ km^2 (UN, 2005). The average annual rainfall is about 1800 mm. With long-term annual rainfall between 1500-2500 mm, the shallow aquifer is still fully replenished during years of normal rainfall (Tirtomihardjo, 1996). However, the rapid growth has caused contamination of the shallow aquifer. In pace with rapid industrial and demographic development of the city, many buildings and households are consuming groundwater through private water drilling system in order to fulfil the high demand of clean water. In 2003, the amount of clean surface water supplied to the industrial sector was only about 3.5 million m^3 or 1% of the volume required by the industry; thus, the industry is very dependent on groundwater (Delinom, 2007). It leads to over-exploitation of groundwater, which has further negative impacts; for examples land-subsidence, severe flood, and seawater intrusion. These impacts have been becoming more evident in the last few years; e.g. the decrease of groundwater level by up to 5 m/year (PPGPA, 2008), land subsidence rate of around 10 cm/year (Delinom, 2007), and severe flood hit Jakarta in 2007 that caused total lost of 2.05 billion USD and 159 lives loss (Waspola, 2007). Initial negative phenomena have actually been recognized earlier; for example, by Schmidt et al. (1990) in their study about Jakarta's groundwater in 1983-1985. Surprisingly, the early indication did not lead to improvement in Jakarta's water management, but to an even more severe condition than before. Evidences show that although some water management researches (e.g. Delinom, 2007; Tirtomihardjo, 1996) have been made, the implementation was not visible.

As increasingly acknowledged many water crises are often results of wrong management. PAM JAYA (Perusahaan Daerah Air Minum DKI Jakarta), the water supply enterprise owned by the provincial government of Jakarta, was responsible for the provision of water supply to the people of Jakarta. It operated the water supply system from 1922 until early 1998. Aiming to improve the water service for the city and reduce deterioration of the environment, the government has

negotiated with two private operators to participate in the water management. Since 1998, the Jakarta water supply service has been divided into western region (by PT Palyja) and eastern region (by PT Thames Pam Jaya; later became PT Aetra Air Jakarta).The type of private sector participation or public-private partnership (PPP) chosen is a 25-year concession contract. However, the achievement made after the privatization was not as good as expected (Lanti, 2006). Lanti made a comparison between the condition in 1996, the expected condition in 2002, and the actual achievement in 2002. Further, according to this study there was no significant reduction of groundwater overexploitation. The service coverage and unaccounted for water were slightly improved but still far from expectation. The amount of water sold was also below the expected target.

This paper aims to present the current stands of water problems in Jakarta and to pose critics concerning the water management accordingly. The implications of our research finding are to provide a scientific contribution by analyzing the water shortage problem from its management perspective and to stimulate further research projects in pursuit of providing sustainable water management solution.

Discussion

It seems that the attempt to improve the condition through privatization did not work well as expected. Privatization has been believed to provide efficient management through acquisition of skills and experiences, increase of investment, and creating competition for the benefit of the consumers. However, as Prasad (2006) argues, the failure of privatization is partly due to the domestic political economy environment and the weak regulatory mechanism. Having analyzed the water management in Jakarta, we have found out that the core problematical issues behind the water shortage problem in general concern with management of competences. We categorize the competences into five groups, namely technology, networking, behavioural, regulation, and marketing, which will be discussed below.

Technology

Majority of the existing water infrastructures (pipelines) are old (inherited from the Dutch). These infrastructures have been used without much capacity adjustment and adequate maintenance. Therefore, it is not surprising that currently a high investment for reconstruction is needed in order to reduce the water leakage level. The government tends to have interest on big water projects (e.g. building dams, multi-purpose tunnel). Small decentralized projects that perhaps are more effective have received less attention. In term of quantity, there is enough water available in Jakarta and its surrounding areas. Yet due to pollution, the quality of the available water is deteriorating and has caused difficulties in finding good quality raw water.

The authors suggest that the decision to apply a certain type of technological innovation should be based on deliberated cost and benefit/impact analyses especially concerning with its benefit for the community and its impact to the environment. At the first stage of the technology selection process the tendency to simply follow the current trend should be avoided. Furthermore, investment spent only on the improvement of pipelines structures will not be effective if it is not accompanied by investment aimed for building an appropriate wastewater treatment mechanism. Moreover, with regards to environmental concern the act of cleaning existing water resources, ecologically recycling wastewater and preventing pollution could be more economically appropriate rather than trying to find new water resources. The next salient stages in this simultaneous technology selection process are implementation of the project, control and maintenance of the applied technology equipments.

Networking

Solely in 2005 there were 20 water projects offered for privatization (Bisnis Jakarta, 2005). In order to improve the infrastructure (supply-side perspective) the partnership is made up of private enterprises, particularly foreign investor. In many cases this current private-partnership (PPP) is partly adjusted to the pressure from donor agencies (e.g. the World Bank), the business interest of elite groups, and the political interests. As a consequence of this, the government itself and the society, particularly the poor, did not get any significant benefit. Despite the unsatisfying experience, perhaps due to a lack of fundamental knowledge, competence, skill, and power in designing the partnership management, apparently the government keeps on pursuing this option. In this case the active role of local communities has received less consideration. Consumers tend to be viewed only as passive users. Moreover, distribution of tasks and responsibilities between the Indonesian Ministry of Environment and the Ministry of Public Works, the two ministries that are supposed to be responsible for clean water management, is rather unclear. This problematical issue often leads to difficulties in the implementation process-, control-, and maintenance of the project.

Partnerships at all levels of stakeholder members that include the government, community, and private sectors should be considered. Two main questions should be addressed, namely what kind of partnership is appropriate and whom should the government creates partnership with? Suggestions can be made by considering the following aspects i.e. (1) community should be actively involved in the designing process of partnership management, (2) priority should be given for the poor and relatively low-income people, (3) every partnership management should be targeted to improve consumers' satisfaction and to guarantee a high long-term level of environmental protection, (4) the labour division and cooperation among responsible ministries for water management should also be closely networked and improved to create work transparency and efficiency.

Behavioural

The current water management is basically pursued using a top-down management approach, in which the government and the private sectors are in charge of holding the control over water management. The citizens are hardly involved in and/or informed about the design and planning of the water management. No transparent information on pricing policy, on quality and safety issues of the delivered clean water and on the issue of consumer's rights often results in a low awareness and motivation level of the consumer to consume the delivered clean water provided by the PAM and its partners. Therefore, it is not surprisingly that almost all of the individual household have their owned ground water drilling system although the clean water delivered by PAM and its partners is available.

Therefore, in this case we suggest that the top-managers of clean water enterprises should consider designing a new behavioural educational conception for the consumers. Because the only one approach usually used by the government (and its enterprises) i.e. through external pressure (e.g. through policies and regulations) in the future will be no longer effective. Another option that relates to the amplifying people's internal motive and motivation should be considered. Instead of pushing people to do something (compulsory), a stimulation can be given to make them *want to do* something (voluntary). Further, a positive external motive (opportunities, incentives) and people's internal motivation should be combined in a way so that expected action can be achieved (Heckhausen and Heckhausen, 2008). This concept can be applied not only for the communities as users of clean water, but in general it is also relevant for the governmental officers and private sectors employees. Capabilities to promptly tackle problems and to provide appropriate solutions need to be improved. Less bureaucracy, efficient organization platform, a high commitment to act according to the standard procedures and

consumer-oriented management must be established to pursue a long-term sustainability. Incentives to conserve water and to protect environmental resources should be developed.

Regulation

Looking closer at Indonesian regulation, we found out that there is a lack of consistency of water regulations and their enforcement. Articles 33 of the Indonesian 1945 Constitution and Irrigation Law No. 11 year 1974 encourage the government to have more control over natural resources and the democracy/ collective use/ management of the natural resources. It can be said that the privatization in 1998 took place without an adequate legal foundation since the regulation concerning privatization in water sector emerged afterward (e.g. the Presidential Decree No. 96, the Water Law No. 7 year 2004, and the Government Regulation No. 16 year 2005). Another example is concerning with water quality standards. Apparently, many concepts concerning with quality standard and safety issues were made only to satisfy the bureaucracy system. In fact, some standards have been well defined by the Health Ministry (Depkes), but it is unclear whether those standards are well communicated or familiarized to the communities. Moreover, the implementation of those standards in the clean water production and distribution process is still questionable.

Moreover, concerning groundwater abstraction, Walhi (Indonesian Environmental Agency) has stated that the sustainable amount to be exploited yearly is 186 million m^3; in reality it reached 320 millions m^3. Yet there is no clear restrictions on the amount of water a household can pump. For private companies the limitation is 100 m^3/ day (Simamora, 2007). Later on, the provincial government has issued Governor Regulation (Pergub) 37 year 2009 concerning the increase of groundwater tax by 16.7 times for luxurious households and 6.9 times for industries (Republika, 2009).

We argue that the above mentioned tax-mechanism will not work efficiently since the government does not even able to measure the volumes of groundwater abstracted and many unregistered deep wells are still to be found. Such a policy will only work if strong law enforcement and monitoring exist. The authors suggest that the government needs to construct adequate and appropriate water regulations. It means that firm legal foundation should be created before any further action can take place; the regulation made should be designed in the form of a tailor-made laws according to the situation in Indonesia (not simply absorbing 'in-fashion' policies). Finally, the regulation must take into account the proper law enforcement and control as well.

Marketing

The last important competence to be improved is concerning with marketing aspects of clean water. So far, there is lack of effort in promoting and developing consumer's awareness of and motivation to participate in the water conservation program and in the water management at all levels. Pricing strategy of clean water is usually being set up by the PAM and its partners. Consumers do not have any chance to influence this strategy. No consumer study about this issue is performed. Therefore, it can cause consumer's low acceptance to consume clean water.

Beside of that above mentioned marketing issues, the promotion of awareness and motivation should also be done at management level. So far the governmental water supply enterprise (PAM) is managed by government officers, who work on a fix salary basis. They do not have any additional incentive to work more efficiently and to think of innovative way.

In this paper, we suggest that PAM and its partners need (1) to apply new marketing approaches in order to improve consumers' awareness of, trust in and motivation to consume clean water

rather than to consume ground water, (2) to develop social marketing actions, which have main aim to leverage consumers' awareness on the issues of water conservation and environmental protection. In term of personal management (3), we argue that an incentive system needs to be created in order to attract communities, government's offices and private sectors to fully engage in conserving water management. At governmental level, incentives can be initiated to encourage efficient and innovative working culture. Some types of incentive systems can be adopted such as monetary and non-monetary (social) incentives.

Suggestions for Future Research

Regardless the trend, what kind of technology would be suitable for Indonesian situation? Consideration should be given not only to big centralized projects but also to small decentralized projects. Since efforts to provide access to clean water will most likely not be successful unless accompanied by pollution prevention, one should ask what could be done to balance/ combine those two aspects. In term of networking, identifying alternatives of privatization that suitable for Indonesian situation will also be a challenging research topic. Another interesting research topic is concerning marketing and behaviour, namely how to promote awareness, knowledge, motivation and active participation in water management at all levels. An investigation about incentives that will be attractive for all parties to participate and to have commitment will be essential.

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