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Public Private Partnership of Waste Management in West Java

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Abstract. Despite the prominent reputation of West Java amongst Indonesian local government at the national level, waste management situation has remained not optimal. Fatal waste disasters in the form of landslides have occurred in this province. As a response, the Provincial Government of West Java created several regional policies for waste management. One area affected by policy implementation is the region of Nambo. This policy involved a cooperation scheme between the local government and a private entity public-private partnership (PPP) to establish the Nambo Final Waste Treatment and Processing Facility (known locally as TPPAS). This study seeks to examine and analyze the PPP scheme at TPPAS Nambo and produce a policy recommendation that might answer the study problem. Using descriptive methods and the qualitative approach, this study observes that the cooperation scheme has problems, including its financing scheme and the price determination for the refuse-derived fuel. Our analysis focuses on the situation at Nambo’s waste management, descriptions of the implementation of the PPP policy by the government and the private entity, the financing scheme, and optimization of the cooperation policy. This study covers problems, like imperfect waste management, a mazy financing scheme for waste management, and stalled optimization of the PPP policy for waste management. Finally, we recommend that an effective regulation should be the basis of regional cooperation policy in the area of waste management, and coordination across government agencies is required to ensure improvements in waste management performance in the regions.

Keywords: Cooperation, waste, financing scheme, Nambo

INTRODUCTION

Waste comprises waste material from human activities. Waste has no economic value and can have a negative economic value because a substantial amount of money is required to discard, clean, or manage it properly. Waste and its management are becoming an increasingly urgent problem in the cities in Indonesia. When managed improperly, waste harms all aspects of the environment land, water, and air (Maulana, 2012).

Data from the Ministry of the Environment demonstrates that the waste volume in 2017 had increased to 65.8 million tons. Furthermore, the director-general who manages garbage, waste, and dangerous and toxic materials from the Ministry of the Environment projected that the household waste volume in 2018 had increased to 66.5 million tons. This number is compounded by the low rate of waste transportation to the final disposal location (known in Indonesia as a TPA). According to Indonesia Waste Statistics, the percentage of waste transported to the TPA increased to nearly 70%. However, the amount of waste processed remains low (7%) (IDN Times, 2018).

According to our review of the literature, current valid data related to the total volume of waste in the province of West Java is unavailable. In 2016, a report by the Indonesian Forum for Environment (WALHI) of West Java revealed that the production of household goods, food and beverages, and other goods consumed by the community produced 27,000
tons of waste per day in West Java, approximately 10 tons of waste was processed by the scavengers every day, and the remainder of the waste was disposed of in TPA Sarimukti. From the thousands of tons of garbage, approximately 4 tons of waste is processed into compost per day (Tirto.ID, 2017). The remaining waste, more than 1,000 tons, accumulate to become a mountain of waste.

The main type of waste in West Java’s waste stream is food (approximately 48.77%), followed by plastic (approximately 13%) (Republika Online, 2018). The estimate of the volume of waste produced in four districts in Bandung (i.e., the City of Bandung, Bandung district, Sumedang district, West Bandung district, and City of Cimahi) increased to almost 5,000 tons per day and continue to increase annually (Pikiran Rakyat, 2018). The City of Bandung has 2.5 million inhabitants and produces 1,500 tons of waste per day (wartega.co.id, 2017). Based on those numbers, an estimate of how much waste is produced by the people of West Java per day is notable.

Waste management is thus a substantial task for the Provincial Government of West Java. Besides, an insufficient amount of land is available for final waste disposal locations (known locally as TPAs, Tempat Pembuangan Akhir). Waste handling is also blocked by the slow procurement process of TPAs. The district and city governments are responsible for waste management but are having difficulties because of the insufficient number of TPAs. Thus, unsurprisingly, in 2017, West Java’s Provincial Government’s performance related to waste management was only 67.11% from the target of 70% and national 80% (prfmnews.com, 2018).

The difficulties of waste management in West Java have been a long-term, unsolved problem. The public remembers one fatal event related to inadequate waste management in West Java near TPA Leuwigajah, Leuwigajah Village, Cimahi. This tragedy occurred on Monday, February 21, 2005, in the early morning (mediaindonesia.com, 2018). The event shocked the Indonesian public and the world and convinced many parties of the importance of waste management.

As a result of 2 consecutive days of heavy rain and an explosion of methane gas from the waste pile, which had been managed improperly, the mountain of rubbish that had accumulated in TPA Leuwigajah slid down and buried nearby residential areas. 139 houses in the villages of Cilimus, Gunung Aki, East Batujajar, and Pojok, Leuwigajah, were buried in an avalanche of millions of cubic meters of waste (Cahyana, 2005; Pikiran Rakyat, 2017). The “tsunami” of garbage was a tragedy that killed 157 people. The size of the avalanche of waste was greater than 200 m long and 60 m high. Like a tsunami, this mass of inorganic (e.g., plastic, foam, wood) and organic wastes crashed into two densely populated districts and destroyed them (Malang TIMES, 2017).

The tragedy was not the first at TPA Leuwigajah. A similar incident occurred in 1992, but fewer lives were lost compared to 2005. The failure signs of the existing TPAs system were obvious at Bandung City since TPA Cicabe and Jelekong were dysfunctional and TPA Sarimukti were located too far away from the TPA Leuwigajah than the Bandung City TPA (kompas.com, 2011). The waste from the City of Bandung was disposed of at TPA Leuwigajah and was established as the Central TPA for three areas the City of Bandung, the District of Bandung, and the City of Cimahi.

The TPA Leuwigajah landslide tragedy should have never occurred, and the City of Bandung would have never been branded the “City of Waste” if the waste had been managed properly. More than 4,000 tons of garbage per day was being transported to TPA Leuwigajah from the City of Bandung, the District of Bandung, and the City of Cimahi. Residential waste comprised the greatest share of the waste stream at this facility (approximately 3.028 M³), followed by market waste (459 m³), industrial waste (366 m³), road waste (295 m³), waste from public facilities (184 m³), and business or commercial waste (168 m³) (blog.ub.ac.id, 2016).

The provincial, city, and district governments of West Java improved their policies regarding waste management after these fatal tragedies.

Law 23/2014 on local government addresses waste matters. The law proposed developing a system for garbage management that would ideally be maintained by the district and city governments, and the development of the system and waste management in the regional area would be maintained by the provincial government. In that context, the Provincial Government of West Java asserted its position on waste management. Waste disposal that cannot be managed by districts and cities will be coordinated by the provincial government.

This study investigated the cooperation scheme for regional waste management in the province of West Java, Indonesia. Waste management in West Java is based on Regional Regulation 1/2016, which is based on the Amendment to the Regional Regulation of West Java Province 12/2010 on waste management in West Java.

The cooperation scheme in this study is the waste management cooperation scheme used by the Provincial Government of West Java, that is, a public-private partnership (PPP) scheme the residents refer to as KPBU, an abbreviation for Kerja Sama Pemerintah dengan Badan Usaha, in the TPPAS (the final waste disposal and processing place), in Nambo. A PPP is a form of the cooperation agreement between the public sector (government) and private sector (private) to provide a public service facility. The form of the PPP depends on the contract and risk-sharing. The basis of the PPP discussed in this study is Presidential Regulation 38/2015.

Waste management is regulated in Law 18/2008 on waste management and Law 23/2014 on local government. The governments’ policies on waste management were specified in the Attachment to the Law 23/2014. Waste management has also been strengthened with PPP regulations related to waste management services. Notably, waste disposal remains a difficult problem to solve in some areas of West Java.

PPP schemes can solve funding difficulties, which are the local governments’ usual obstacles to proper waste management (Noor, 2016). Several regions have been implementing the PPP scheme, but this cooperation scheme has not been a complete success. For example, the PPP to support a monorail project that included the Government of DKI Jakarta Province failed because of insufficient financial guarantees and uncertainty regarding the tender.

Regarding waste management, the city of Surabaya has been implementing a technologically innovated waste management system through a PPP but has been unable to improve its capacity to transport its waste. The City of
Makassar represents a similar case, despite its PPP with a foreign company, its waste problems remain unsolved. These problems include the insufficient accuracy of the process of the final waste disposal method and the failure to evaluate to determine the results of the PPP (Nahruddin, 2016).

Another problem in waste management is the tipping fee/gate fee. The tipping fee is the fee paid by the government to investors for waste management services (Kurniawan and Setyobudi, 2013: 25). The investor cannot reach an agreement with the government because of the high tipping fee. In the province of Bali, for example, the Bali government cannot reach an agreement with potential investors because of the high tipping fee of approximately USD 30/ton (denpostnews.com, 2017). The Mayor of Surabaya in 2015 was reported to the KPK, because of the alleged corruption of the tipping fee payment. The transfer of Rp 78 billion as the tipping fee for waste management services allegedly led to corruption (beritasatu.com, 2015).

The tipping fees in the regions are not regulated by the ministerial government. The only Asian country that specifies a tipping fee is China: USD 13.04 to USD 19.56 per ton for a waste management waste to energy (WTE) scheme. China also specifies a different tipping fee in each area. For example, the tipping fees in Beijing and Tianjin are USD 16.3 per ton and USD 9 per ton, respectively. Notably, TPPAS locations in one province can have different tipping fees (Zhao, Jiang, money, 2016: 2-5).

Many studies have investigated PPPs, for example, Wu, House, and Peri (2016: 1-25) investigated the cooperation of the Indian government in water and sanitation by making a comparison with water management cooperation conducted by China. Wu et al. demonstrated that the problems in the two countries were their need for water tariff reform, strong supervision, support from the government, and regulations to maintain cooperation sustainability.

Chou and Pramudawardhani (2015) also studied the PPP schemes in various countries, namely Taiwan, Singapore, China, the United Kingdom, and Indonesia. They compared countries’ PPP success factors, and Indonesia was the basis for the comparisons with the other countries. The researchers concluded that the reasons for the success of the PPP in Indonesia were almost the same as the reasons for success in China and exactly the same as the reasons for success in Singapore.

Osei-Kyei and Chan (2017) analyzed a PPP scheme implemented by the Government of Ghana in the market development project of the Kojokrom and Water Processing Projects of Asarara. Osei and Chan found five success factors for the PPP scheme, commitment and support of the government, support from the community and strong community relations, openness and constant communication, the profitability of the project, and the private sector abilities. They conducted the study because no examples in the literature had investigated the success factors of the Ghana PPP scheme.

In the context of Indonesia, Susantono and Berawi (2012) investigated the KBPU scheme. They analyzed the policy and strategic steps to achieve infrastructure development by using the PPP scheme. The study investigated the implementation of the transparency and accountability principle, institutional capacity empowerment including on the regulatory side, financial arrangements and the balanced division of the risk, and guaranteed investment on the infrastructure projects.

Sari and Utomo (2012) analyzed the cooperation scheme of the infrastructure development project of the Sidoarjo Square shopping center in Sidoarjo East Java. They observed benefits for both sides, the private investors and the government received adequate benefits after 12 years.

Shams, Sahu, Rahman, and Ahsan (2017) examined waste processing in Bangladesh and observed that the government’s waste management policy did not include goals for energy conversion, goals for recycling rates, and incentives to minimize waste production. Bangladesh produced 1.29 million tons CO2 equivalent (CO2e) of greenhouse gas in the composting process at the TPA and 250.95 million tons of methane gas (CH4). If that CH4 was converted into energy, the government could save as much as USD 1.89 million.

Hénault-Ethier, Martin, and Haussot (2017) presented a different view that offered an organic waste management model for the Government of Quebec, in Canada. The model is suitable for application in states like the provinces in Indonesia. The model was developed to control the management of organic waste, which was managed by the Government of Quebec. The model can be used as a reference to develop and implement policies related to waste processing from various perspectives. The model ensures that government investment in waste management processes is performed properly. Either et al also suggested an increase in the tax on domestic waste production to increase the efficiency of the waste management process. The government also suggested investing more in the socialization process to increase community awareness, investing more in environmental education, and being more careful of short-term benefits. Please ensure the changes preserve the intended meaning.

According to our review of the literature, few studies have investigated waste management in Indonesia in a regional context. One such study focused on tipping fees but did not explain the tipping policy fee and the price determination in detail. Many PPP schemes are not for waste processing, and most studies have generally focused on PPP schemes for other types of infrastructure development.

This study investigated regional waste management cooperation in West Java, Indonesia, by focusing on TPPAS Nambo: the location, the PPP and its financing scheme, and the optimization of the cooperation policy implementation.

**RESEARCH METHOD**

This study used a qualitative approach with the descriptive method. Data collection was conducted by field observation and in-depth interviews. The secondary data were electronic documents and physical documents collected from the same location as the data. The data was also obtained through focus group discussions with the local government stakeholders in West Java, PT Jabar Bersih Lestari (JBL) as the tender winner of the TPPAS Nambo Project, main news outlets online, and experts in governance. Maybe words are missing. Please review and if necessary, revise.

The collected data was summarized, notable data were selected, and recurring patterns were observed. The data were presented by describing the observation and interview.
results in narratives. The data were supported by documentation, photos, and pictures, then, conclusions were drawn.

This study was conducted for 2 months, August and September 2018. West Java was the location for the study because this province has a contract with PT JBL on TPPAS Nambo, Bogor, with a PPP scheme. Notably, West Java has biomechanical waste processing technology that produces the refuse-derived fuel (RDF) required to produce cement.

RESULTS AND DISCUSSION

In this section, we review four main topics: the location of TPPAS Nambo, the PPP and its financing scheme, and the optimization of the cooperation policy implementation.

TPPAS Nambo

Nambo was a nonproductive forest in the Mount Leutk region, owned by Perum Perhutani Regional Division Jabar-Banten, in the District of Bogor in West Java. On August 18, 2014, a cooperation agreement was signed by the Governor of West Java Ahmad Heryawan, District Head of Bogor Rachmat Yasin, Mayor of Bogor Bima Arya, and the mayor of Depok Nur Mahmudi Ismail to build TPPAS Nambo. The proposed facility was supposed to manage from 1,500 to 1,800 (the maximum capacity) tons of waste per day.

The entrance to TPPAS Nambo is in the village of Curug Dengdeng (in Lulut Village, Klapanunggal Subdistrict, Bogor) and 6.6 km from the exit of the Gunung Putri Gate of Jagorawi Toll Road. Residents know the 55 ha location of TPPAS Nambo-Lulut as the Mount Leutik area or block, Lulut village owns 40 ha, and the remaining 15 ha in the village of Nambo is owned by the District Government of Bogor.

The land in Nambo was prepared to build the Integrated Waste Processing Facility (TPST) Nambo. This new facility replaced TPST Bojong, in the village of Bojong, in the subdistrict Klapanunggal. The reason why TPST Bojong was replaced because the provincial government realized that TPA Galuga (in the subdistrict of Cibungbulang, in the District of Bogor) could not accommodate the waste from the District of Bogor and the City of Bogor. The communities of both local governments often protest against the existence and management of the TPA, especially after it was apparent that the TPST Bojong, built by PT Wira Guna Sejahtera in a PPP with the Provincial Government of DKI Jakarta and the District of Bogor, failed to operate because of their rejection (kompas.com, 2017). The provincial government had to break the bank to fulfill the resisting aspiration of the local community. The aspiration of the locals could vary from football pitch to masjid.

The District of Bogor offered to provide land and encouraged the Governor of West Java to establish a regional TPA development cooperation. The location was available and a confirmed industrial area in the RUTR Kalapanunggal Bogor District that could accept the waste management industry. The proposed new location was relatively far from the residential area, which is one of the differences compared to the location of TPST Bojong, and not far from Nambo Station. Notably, this time, the public did not protest.

Most importantly, other than being in an area of the mining industry, unused land owned by Perhutani was available, which would facilitate an expansion of the waste management facility by the Provincial Government of West Java (jabarprov.go.id, 2014).

The local community was allowed to continue to enter and use the unused location until further notice (kompas.com, 2017). The four main sources of funding for TPPAS Nambo were provincial funds from West Java, state funds from the Ministry of Public Works, state funds from Community Housing, and funds from the private sector. The 55 ha of land was purchased by the District of Bogor (15 ha) and West Java (40 ha owned by Perhutani). The province also paid to build the wall surrounding the area and the road in the TPSTP. Notably, West Java spent at least Rp 50 billion from 2011 to 2012.

The State Budget, through the Ministry PUPR, paid for the final waste containment pools or residue pools in the form of a pool of sanitary landfill and wastewater processing. Financing for the installation included Rp 600 billion from the private sector in cooperation with the region-owned enterprise of West Java Province. The operation of the processing installation should begin in June 2019. As much as 30% of the forested 55 ha TPPST area will be reforested.

Regional Waste Management Cooperation

Various regions have implemented many versions of PPPs, regarding the provision of infrastructure and public services. West Java is one of the provinces that apply PPP in waste management. It is the biggest waste-producing province in Indonesia and has proposed building a technology-based waste processing management facility. The problem is that the district government cannot undertake this waste management plan alone because paying for its implementation using district funds is not economically feasible, and no land is available. The regional concept of waste processing was developed by the Provincial Government of West Java.

The development of TPPAS Nambo has been conducted through a PPP between the Government of West Java and PT JBL. The signing was performed by the Governor of West Java Ahmad Heryawan and President Director of PT JBL Doyun Yu in June 2017. This project uses the PPP scheme. PT JBL, as the tender winner, was established by a consortium for the procurement of waste management infrastructure. TPPAS Luna accommodates waste from the District of Bogor, the City of Bogor, and the City of Depok. These three areas have a combined population of almost 9 million.

The agreement stipulated that TPPAS Nambo would produce dry waste or RDF, the fuel for cement production. The proposed types of waste processing technology are mechanics and biology (biodrying) technologies. Biodrying reduces the level of water in the organic material by using microorganisms that naturally increase the temperature in the disintegration process. Biodrying can decrease the percentage of water from 60% to less than 20% in less than a month.

First, the mixed waste was separated from the inert material, such as plastic, glass, wood, hazardous materials, and rubber. Next, the mixed waste was channeled into chopping space, kept in a closed space, and air/oxygen (O2) was blown continually at a certain volume to support the aerobic process for 14 to 21 days. The temperature in the
bio drying room can increase to 70°C, which is the effect of exothermal aerobic waste processing (Velis, Longhurst, Drew, Smith, and Pollard, 2009: 2747-2761).

The output of this process is often called RDF. Other terms for RDF are solid recovered fuel, briquettes, or pellets (compressed RDF). RDF is often used as fuel for industrial boilers. The potential energy from the RDF comprised of the raw material from urban waste is 15 MJ/kg, or almost equal to coal (26.47 MJ/kg). This RDF will be used as a replacement for coal for the cement industry or power plants. In Indonesia, this technology has been tested by the cement producers Tiga Roda, PT Indocement Tunggal Prakarsa Tbk, Citeureup, District of Bogor (kompas.com, 2016). With the waste capacity of 1,500 to 1,800 tons per day, TPPAS Nambo was expected to produce a substantial amount of RDF.

West Java will also develop six additional regional TPPASs, Legok Nangka in Bandung, Lulut Nambo in Bogor, Ciayumajakuning (Cirebon, Indramayu, Majalengka, Kuningan), and Bekapurr (Bekasi, Karawang, Purwakarta). The current focus of West Java is on establishing the Lulut Nambo TPPAS (TPPAS Nambo) and Legok Nangka (TPPAS Lena). Regarding the infrastructure, TPPAS Nambo is more ready to operate than TPPAS Lena. Products produced by TPPAS Nambo and TPPAS Lena are different. TPPAS Lena will operate under the concept of WTE and produce electrical energy.

To implement the PPP scheme for the Nambo waste management project, the West Java Provincial Government worked with PT JBL. The cooperation was based on Regional Regulation 1/2016, which is about the changes to the Regional Regulation of West Java Province 12/2010, which is about waste management in West Java. Both parties entered into an agreement to develop TPPAS Nambo in the District of Bogor. PT JBL, as the winner of the tender, was established by a consortium to procure waste management infrastructure. TPPAS Nambo collects waste from almost 9,000,000 people in the community district/City of Bogor, City of Depok, and South Tangerang.

PT JBL had proposed a waste processing system, according to a document request from the government. The government specified that the technology used in the Nambo project is mechanical-biological treatment (MBT), to produce processed materials as the replacement of coal. A bioprocess will dry the separated waste. Waste is inserted into a room and then covered with a membrane. Next, the anaerobic drying process occurs, that is, bacteria heat the waste and the water content evaporates.

The process to select the winner of TPPAS Nambo was time-consuming. The process started in 2009, with several district and city governments. In 2014, the process became a cooperation agreement scheme. PT JBL was formed from 45 foreign and local companies that proposed a consortium format; next, four agreed to the government’s requirements. As part of the agreement, PT Jasa Sarana, a regional-owned enterprise of West Java, must participate in the management of the consortium that operates TPPAS Nambo, along with several other companies, namely a South Korean company and a Malaysian and Indonesian Company (PT Panghegar Energy Indonesia), which then formed PT JBL to operate Nambo TPPAS.

Notably, according to Sudartooyo from PT JBL, the stake of PT Jasa Sarana was not clearly stated in the cooperation agreement. The provincial government argued that the region merely wanted to contribute to waste management, although they may not have a stake in the entity. As a solution, the local government appointed 20% of the ownership to PT Jasa Sarana, and the remaining 80% is for other consortium members.

TPPAS Nambo was originally supposed to be managed by the government of the District of Bogor. However, because a regional waste processing policy is under the authority of the provincial government, they took over the management from the government of the Bogor District. TPPAS Nambo had originally been selected by the Bogor District Government. Since then, a policy change occurred, and the provincial government then conducted a location survey and entered into a road access agreement with PT Indocement, because the access road to the facility would pass through the land owned by PT Indocement. PT Indocement offered to build the access road on the condition that the RDF output would be sold to PT Indocement. However, because direct sales might violate the antimonopoly law, PT Indocement was provided the opportunity to become the first bidder in the auction for the RDF output. The preferential treatment received by Indocement is valid for several reasons. For example, in addition to being the most proximal to the processing location, the quality of RDF declines when transported to a location farther away. Besides all the cooperation issues between private-public entities, the provincial government also faced another obstacle like the reluctant agreement within the local governments. The local government like South Tangerang were outside the jurisdiction of West Java, so it took the uniting body from the national level since the cooperation would be considered as provincial. The involvement of the Ministry of Home Affairs brought this coordination into a higher level of bureaucracy. The uncertainty of the amount of Tipping Fee sprung hesitation within the local governments to succeed regional cooperation since they couldn’t meet a moderate financial scheme to run this project.

**Financing Scheme**

At the time this study was written, TPPAS Nambo was not operating. Two main problems have been that the financial close agreement between the company and the bank has not been finalized and the company requires 70% additional capital for financing. The bank could not extend a loan because no price agreement has been reached regarding the RDF with PT Indocement, additionally, the government has not issued a regulation regarding the RDF price. According to the agreement, TPPAS Nambo will commence operation in June 2019, but the financial close required by the central government (Bappenas) has not been obtained.

PT JBL signed a cooperation agreement with the Provincial Government of West Java on June 21, 2017, approximately 2 years after the announcement of the auction. The government provided PT JBL 6 months to secure the financing (financial close). The funding for this project was supposed to be 30% equity and 70% bank loan. During the period of 6 months since the agreement, PT JBL must have signed a loan agreement with the bank and disbursed the loan to finance the project. PT JBL experienced problems related to the investment feasibility that the
The bank required. The bank does not consider the financing method on one side, such as the nominal tipping fee specified, but also the RDF selling price. The price of RDF has not been set by the government. The rules and regulations regarding the price of RDF prices are limited.

a. Financial Close

The government should set the price of RDF (Caracol, 2016: 6), just like prices for toll roads or a hydropower facility. The price of the main source of income of the PPP should be determined in advance by the government, such as a toll fee and electricity tariff, before signing the contract. Toll tariffs, for example, have been regulated in Law 38/2004, in Roads Article 68 paragraph (3), and Government Regulations 15/2005, about toll roads. The electricity tariff is set in Regulation of the Ministry of Energy and Mineral 1/2017, on Parallel Operations of Power Plants with PT PLN's Electricity Network.

The TPPAS Nambo project has stalled for more than one year in the financial close stage (i.e., the contract was signed on June 25, 2017). The delay was mainly because of the absence of regulation on the selling price of the RDF, which made the price negotiation with PT Indocement, as the main buyer, challenging. The delay also made the bank reluctant to provide the required financing (70% financing was required for this project). These RDF projects have become unbankable. A temporary solution from PT JBL has been to submit a proposal to the bank to obtain the required financing by using the market price of coal because RDF is the replacement for coal.

b. Tipping fee

Despite Regional Regulation 1/2016 on waste management, the local government complains that there is no guidance in the form of central government regulations regarding the ideal amount of funding to finance a waste management project, including the tipping fee. The local government has insufficient budget resources to support a PPP policy in waste management. Fiscal assistance from the central government in the form of Dana Perimbangan in waste management is required.

According to the plan, the tipping fee, which will be paid by the Provincial Government of West Java to PT JBL, is similar to what PT JBL would receive from RDF sales. If the government determines a tipping fee of Rp 125,000 per ton with the amount of incoming waste at 1,500-1,800 tons per day, then the total would be approximately Rp 187,000,000. The RDF produced would also have a similar amount. For example, the volume of garbage dumped at the Nambo facility was approximately 1,500 tons, and 30%-35% or approximately 500 tons of waste would produce RDF; 10%-15% would only be residues, and the remainder will evaporate. The currently proposed price for the RDF is Rp 300,000 per ton. This results in Rp 150,000,000 of revenue, and that number is similar to the amount of tipping fee to be paid.

The tipping fee is officially set in several countries. For example, China has set a price from USD 13.04 to USD 19.56 per ton for waste management WTE. China also specifies different tipping fees in each area. For example, in Beijing and Tianjin, the tipping fee is set at USD 16.3 per ton and USD 9 per ton, respectively. Notably, different TPPAS locations in one province can have different tipping fees (Zhao et al., 2016: 2-3).

In addition to the tipping fee, a problem between PT JBL and PT Indocement was observed. PT JBL wants the cooperation agreement for a period of 25 year, but PT Indocement has only agreed to 10 to 15 year. The community is also becoming an obstacle and has demanded various amounts of compensation for garbage trucks to cross their areas. For example, a community made an unrealistic demand for a football field.

At first, the community offered little resistance to the waste management services in West Java. Various demands (e.g., money, new mosques, and religious education) have been submitted by the community to the Provincial Government of West Java for the TPPAS Nambo project. Besides, 15 farmers claim to have the sell and purchase deed for some land supposedly owned by the Perum Perhutani. The land is part of the land for the TPPAS Nambo project. This problem has hampered the development process (ITB and BAPPENAS, 2017).

Another barrier is the issuance of Government Regulation 24/2018 on Integrated Electronic Business Licensing Services, or mostly known as open system submissions (OSS). The system is not yet fully understood by the local government. For example, an almost completed application of a building permit (IMB) in the District of Bogor must be resubmitted to the OSS, and the IMB process is lengthy and complicated.

Optimizing the Implementation of PPP Waste Management Policy

The implementation of PPPs in waste management should be in line with the prevailing regulation. This regulation applies from the central level to the region that governs the TPPAS Nambo project. The regulation at the central level governing PPP policy is Presidential Regulation No. 38 of 2015, on PPP in the provision of infrastructure. Besides, the TPPAS Nambo PPP policy is also subject to sectoral regulation, Law 18/2008 on waste management, which governs the entire waste management process from the upstream to downstream. There are also Government Regulations and Ministerial Regulation on waste management.

As aforementioned, the TPPAS Nambo project has two items of cooperation: the PPP between the Provincial Government of West Java with PT JBL and the cooperation between local governments, namely, in West Java, the City of Bogor, the District of Bogor, and the City of Depok (the plan also involved the City of South Tangerang).

The TPPAS Nambo project stalled in the stage of financial close or the fulfillment of the financing provisions by the private entity, as stipulated in Presidential Regulation 38/2015. This transitional phase must be fulfilled to move on to the construction phase. Currently, the TPPAS Nambo project reflects the absence of regulation to obtain the financial close. From the perspective of the bank, the TPPAS Nambo project is not bankable. Technological innovations must be quickly adapted in new regulations evolving from PPP because a PPP is characterized by science and technological advancement compared to a conventional cooperation scheme (Link, 2006). Waste management technology has advanced, but the MBT process that produces RDF is still new for Indonesia. Waste management technology also continues to develop in the thermal and nonthermal category, which involves incineration, gasification, and pyrolysis and
composting, bio-drying, and plywood. One innovator has claimed that they can convert the waste into fuel to replace petrol. Such progressive technology is waiting for the necessary regulations to support the TPPAS Nambo PPP project.

Government Regulation 38/2017 on Regional Innovation, supports the implementation of technological innovations at the regional level. But this regulation should be disseminated in the business sector to intensify its use in the business sector. PP No. 38 2017 might provide a temporary basis for the law to support the bankability of PT JBL. While waiting for the regulations at the level of the Ministry of Energy and Mineral Resources (because RDF is a coal-replacement material), a more significant policy could be issued for the use of RDF, by setting a selling price guideline.

The TPPAS Nambo project policy remains limited to the waste treatment and processing stages. Notably, the series of waste handling activities in a holistic approach comprises sorting, collection, transportation, treatment, and processing (Yang, Zhou, and Xu, 2015: 10). Currently, the TPPAS Nambo project has not yet reached the construction phase, additionally, the failure of the PPP scheme in waste management in other areas looms.

For example, the PPP scheme of TPA Telaga Punggur in the City of Batam between the City Government of Batam and PT Surya Sejahtera is already in the construction phase of the operation, experience a reduction of transported waste every day. This situation prompted PT Surya Sejahtera to threaten to withdraw from the project (tribunnews.com, 2010). In another example, the PPP for TPA Bantar Gebang, between the Provincial Government of DKI with PT Gondang Tua Jaya, is having a dispute.

Many factors can cause failure. One factor is the failure by one party to abide by the agreement (Ishar, Sardini, and Astrika, 2017: 14). Both PPP projects have been strengthened by the provision of infrastructure in waste collection, with the provision of garbage collection trucks from the private party; however, the trucks became the source of the problem because of the failure to abide by the agreed route and the standard operation.

This proof indicates that a comprehensive waste management policy from upstream to downstream to support the PPP policy in waste management is necessary. Local governments must cooperate with the private sector in garbage collection to ensure that the waste delivered to the TPA is by the volume in the contract. The waste management in two areas had to be terminated. The BPS data shows that the daily waste transportation capacity (treated garbage) conducted by the city government remains limited. In 2016, only five cities could attain greater than 90% transportation capacity. The Minister of Home Affairs Regulation 33/2010 and the Ministerial Regulation on VAT No. 4 of 2015 have created the opportunity for the local government to conduct the PPP project on waste management beyond the treatment and processing stage (e.g., collection stage).

The performance of the PPP project of TPPAS Nambo must also be strengthened in the evaluation stage, the City of Makassar has performed a limited evaluation on the PPP between the Government of the City of Makassar and PT Gyoko Kogyo (Nahruddin, 2016); this could be a study to improve the performance of the PPP project in TPPAS Nambo. PPP project in TPPAS Nambo must have adequate mechanisms for monitoring and evaluation. Presidential Regulation 38/2015 has stipulated the provisions of the Simpul PPP unit, A unit created by the Governor. This unit will be responsible for performing the stages of PPP, including monitoring and evaluation. Simpul PPP must be implemented earlier before the TPPAS Nambo project. The Provincial Government of West Java stated that at the time of publication, the Simpul PPP unit had not been formed.

The PPP policy for waste management in TPPAS Nambo, as regional policy, has involved several local governments. The government of the City of South Tangerang would also like to join and distribute its waste to TPPAS Nambo. However, cooperation agreements between regions are not yet available. The Provincial Government of West Java and the Ministry of Home Affairs have been urged to speed up the issuance of regulations as the basis of the PPP because this agreement involves several local governments, including provinces from West Java to Banten and the City of South Tangerang, and is more complex than the cooperation agreement among West Java, the City of Bogor, the District of Bogor, and the City of Depok, which was completed with a legal product at the provincial level.

CONCLUSION

As a policy, the PPP scheme of TPPAS Nambo was successful until the transaction stage. The project stalled in the substage of financing acquisition (financial close stage), the determination of the tipping fee, and the attempt to establish cooperation agreements across several local governments. These cooperation agreements involved one entity of district government and one entity of municipal government in one provincial area that observed resistance from the local community and bureaucracy affair between the provincial governments of West Java and Banten and the City of South Tangerang.

The failure in the financial close stage of the PPP scheme of TPPAS Nambo is a reflection of the inability of the existing policy products to manage technological innovations and the inadequate planning function that forecasts the necessity for future regulations. Although the tipping fee was finally specified in the TPPAS Nambo project, the process was long because it was not supported by strong guidelines.

In retrospect, the PPP project of TPPAS Nambo must be supported by the formation of other cooperation. Thus far, the identified cooperation required is in the preprocessing stage. The preprocessing cooperation is expected to fill the missing link because the current state of cooperation is limited to waste treatment and processing activities. The construction and operation stages demand a number of interventions in the form of a holistic policy for waste management.

We recommend, for a holistic policy for waste management to occur, first, the central government, through the Ministry of Energy and Mineral Resources, must develop the legal product at the Ministry level as the basis of the sale and purchase price of RDF.

Second, through the Ministry of Home Affairs, Regulation No. 33 of 2010/33/2010, on Waste Management Guidelines, must be revised to emphasize the following: a) renew sustainability through regulations such as the Government Regulations and Environment Ministry Regulations issued after 2010 to implement Law 18/2008; b) add provisions as a
guideline for the financing of the waste management project (tipping fees) and delegate these provisions to legal products at the provincial regulation level, given the variation between cities and districts in the value of the tipping fee variations are a global phenomenon, and tipping fees must be set with a cluster system at the district, city, and provincial levels; c) campaign for the use of the Government Regulation on Regional Innovation in the regions of the business stakeholders and to regional bureaucracies as a breakthrough toward the implementation of technological innovations in the PPP projects; d) ensure the monitoring and supervision function is conducted optimally by the local governments and in accordance with the provisions in the related regulation, especially the implementation of the Simpul PPP, which is mandated as part of the PPP by Presidential Regulation 38/2015; e) strive to include the City of South Tangerang in the PPP project of TPAS Nambo; f) coordinate with related ministries and institutions to provide additional funds to finance the TPAS Nambo project in the form of transferring funds from the central government to the region.

Third, the Provincial Government of West Java must maximize its performance by: a) achieving synergy across the regional apparatus that supports the PPP waste management policies; b) involving the Legal Bureau that always coordinates with the central government to provide supporting regulation for TPAS Nambo, a PPP; c) encouraging BP3IPTEK West Java as a unit that supervises science and technology to implement the Government Regulation on Regional innovation to create a regional legal product that sufficiently manages technological innovations in TPA Nambo.

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