Lessons Learned:

Public-Private Partnerships (PPPs) in the Delivery of Wastewater and Sludge Treatment Services

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# Introduction

Traditionally, governmental entities have been responsible for providing wastewater and sludge treatment services through public enterprises. Poor service delivery, operational inefficiencies and sluggish expansion plans characterize many of these entities, partially because they are dependent on annual allocations from cash strapped governments to fund their operations. Challenges with users’ willingness to pay, frequently accompanied by an inability to raise tariffs to meet the full cost of service, result in negative cash flows, which restrict the entities’ access to external capital, exacerbating existing service gaps. Although cognizant of the need to improve, many governments of low and middle-income countries lack the financial resources required to rehabilitate and maintain existing networks, let alone invest in capacity expansion. In some cases they do not have the technical expertise required to oversee the enterprise’s evolution into a higher performing wastewater and sludge treatment utility.

Other infrastructure sectors (such as power, transportation and telecoms) have addressed many of these challenges by engaging the private sector, which can infuse capital, expertise and operational discipline. Evidence indicates that such public-private partnerships (PPPs), if structured well, can produce significant results including improved service quality, increased user access, and, in some cases, even a decrease in customer tariffs over time. Although PPPs have been successfully normalized as a framework for improved service delivery within other infrastructure sectors, fruitful partnerships with the private sector have been more challenging to establish in the wastewater and sewerage sector.

This is partly because water services, more so than other infrastructure sectors, are perceived as manifestly social in nature, meaning any effort to introduce commercial and fiscal discipline can evoke strong political emotions. Required to satisfy the most basic of human needs and to safeguard our health, access to water services is often viewed as a basic human right that should not be beholden to market principles. The political realities associated with bill collections and tariff hikes therefore often hamper the successful implementation of projects.

It is within this context that globally, at least 84% of all water and sanitation systems remain publicly owned and managed.[[1]](#footnote-1)While the percentage of publicly owned and managed wastewater and sludge treatment systems is unknown, it is likely even higher given these prevalent challenges to implementing PPPs in the sub-sector. While the population served by privatized water utilities increased from six million to 94 million in developing or transition countries from 1991 to 2000, and the number of countries involved in such schemes increased from four to 38, the outsourcing of water and wastewater management services to private contractors has decreased in the last decade (World Bank, 2009).[[2]](#footnote-2)While the benefits of increased access to sanitation services have been well documented, many governments and municipalities are still failing to provide even the most basic of these services to large proportions of their populations.

This report provides specific examples and global insights on the use of PPPs in wastewater and sewerage management in low and middle income countries around the world. The case studies that follow investigate whether PPPs can and do provide similar operational, managerial, and financial enhancements to utilities responsible for waste water and sludge management that are evident in other infrastructure sectors. The report will also attempt to glean and highlight key success factors from effective waste management PPP projects. Particular focus will be placed on procurement methodology, stakeholder participation, project structuring and risk sharing, enabling environment and operational enhancements provided by the PPP structure. Lastly, the report will identify lessons learned from each case and make suggestions for how to replicate the key elements of the more successful projects, particularly those that benefit the poorest and most under served.

# Case Studies: Asia

## India: Alandur Sewerage Project

**Project Overview**

The Alandur Sewerage Project (ASP) was the first project in India’s municipal water sector developed as a public private partnership. ASP was initiated in 1996 by the chairman of the Alandur Municipality, an area with a population of approximately 165,000 inhabitants, 25% of which lived in slum areas. The proposed sewerage system had the following design features and capacities:

* Capability to serve an estimated population of about 300,000 in 2027
* To be completed within a five-year period from its inception date
* Capacity in the initial phase was planned at a treatment level of 12 million liters per day (mld) of sewage supplied by the municipality. The ultimate capacity would be double this.

The project consisted of two components (i) the underground sewerage system and (ii) the sewerage treatment plant. The construction of the underground sewerage system in the town of Alandur (located adjacent to Chennai in the Chennai Metropolitan Area), involved the laying of pipes, and construction of pumping stations. These components were procured on a Bill of Quantities (BOQ) basis. Operations and maintenance of the underground system was accomplished through a five-year operations and management contract with the private partner, while the construction and initial operation of the sewerage treatment plant (STP) was done using a Build-Operate-Transfer (BOT) contract with a fourteen-year duration. The project was completed in October 2003 and required $55 million[[3]](#footnote-3) in capital investments from various sources including local banks and financial institutions. The table below indicates the sources of financing for the underground sewage system.

**Table 1: Underground Sewage System Financing**

| Source | Percentage of Financing |
| --- | --- |
| Grant from Tamil Nadu Urban Infrastructure Financial Services Limited (TNUIFSL) | 7.3% |
| Loan from TNUIFSL | 14.7% |
| Loan from Tamil Nadu Urban Infrastructure Development Corporation (TUFIDCO) | 39.2% |
| Grant from TUFIDCO | 2.4% |
| Deposits from the Public | 30.3% |
| Interest from Deposits | 6.0% |

To plan this complex and politically challenging project, the Alandur Municipality worked in partnership with Tamil Nadu Urban Infrastructure Financial Services Limited (TNUIFSL), and with USAID’s Financial Institution Reform and Expansion (FIRE) Project. TNUIFSL, jointly owned by the Government of Tamil Nadu State and three financial institutions (ICICI Bank, Housing Development Finance Corporation and IL & FS Financial Services Limited) is the Tamil Nadu state management company formed with the objective of improving urban infrastructure service provision in the state. TNUIFSL procured and managed a private engineering contractor to prepare the detailed technical design and prepare engineering reports for the Alandur project. The scope of work included project design, identification of the locations of pumping stations and the treatment plant, and cost estimates.to improve access and service delivery. Another source of financing was the Tamil Nadu Urban Infrastructure Development Corporation (TUFIDCO), which is a Tamil Nadu State owned company whose main objective is to provide financial assistance and guidance to local authorities.

A ‘*willingness to pay’* household survey was conducted with a 10% sample of the Alandur Municipality population, representing 42 wards. About 97%of the surveyed households indicated both an interest in having a sewerage connection and a willingness to pay an amount similar to that of water supply: up to $33 (equivalent)for connection and $.34 to $.82 per month for service.[[4]](#footnote-4) This represents a fairly high willingness to pay for the upfront connection given the average monthly household income, which ranges from $16 to $81.

**Noteworthy Outcomes**

By 2005, 43% of residents who were offered the new sewerage connection and waste service opted in and paid for their individual connections. In this first phase 23,000 households paid for the service, while 8,350 households were connected. By 2010, 30,600 households had paid for the service, while 29,300 households had been connected. In spite of the slight lag between payments and connections, the first phase of the project was considered a success. It should be noted, however, that about half of the households in the city are still not connected to the network. These households continue to discharge their wastewater into open drains.

**Key Success Factors**

***Stakeholder Participation:*** The chairman and council of the municipality provided political cover and strong advocacy for the ASP project, as did the very popular head of the community, who was also interested in seeing ASP succeed. With the benefit of strong political will and decision making, especially at the grass-root level, persuading the local community to support the project was not an issue. ACP enjoyed a high level of local community ownership given that the initial need had been identified by the community and local authority. Overall, the community ensured that their key objectives were met: an improvement in the health and hygiene of the area and its residents, including poor residents living in the more unhygienic conditions.

***Appropriate Project Structuring:*** Despite the results of the tariff survey, which indicated that public willingness to pay was far below the tariff requirement to meet the capital and operational cost of the project, the municipal council, through its proactive public outreach measures, managed to establish reasonable residential fees for connection and monthly waste services. The municipality also managed to collect the upfront connection fees quickly enough to pre-empt the need for the TNUIFSL loan.[[5]](#footnote-5)

Another important success factor for ASP was the municipality’s access to financing and subsidies from the Government and other entities, established specifically to meet the credit needs of the un-creditworthy municipalities without access to private capital. Based on the willingness to pay survey, the Government agreed to provide subsidy support to meet the operational costs up to $49 per person per month[[6]](#footnote-6). The municipality accepted the high level of fiscal discipline imposed by the strict conditions of the public lenders, TNUIFSL and TUFIDCO. An escrow account was created as an assurance to lenders. In addition to public funding, the collection of household connection fees before project construction contributed to CAPEX. The Government of Tamil Naidu provided a loan guarantee that required any payment made to the utilities on account of a default by the municipality to be recovered from the annual transfer of payments from the municipality to the state government[[7]](#footnote-7).The project also benefited from the state-wide trend of municipal finance reforms.

In addition to pursuing project financing, several efforts were made to fortify the venture’s financial sustainability and reduce financial risk for private partners. For example, a Special Purpose Vehicle(SPV) was formed to undertake the water supply and sewerage scheme on a build-operate-transfer basis[[8]](#footnote-8). The project was designed to procure finances through a financing structure where the lenders and investors were paid back with the cash flow from the project. Another assurance made to the private BOT operator was an agreement from the municipality to provide a minimum amount of sewerage or pay for it, by accepting the ‘take or pay’ condition in the agreement. Treatment of sewerage above the minimum amount was paid in addition.

To incentivize household connection, the municipal government collaborated with banks to facilitate household loan assistance at affordable interest rates. No specific exemptions or support were targeted at the lowest-income households in particular, but rather affordable loans were made accessible to all. In addition to loans, residents were given the option to pay the connection fees in two or three installments.

***Stakeholder Participation and Coordination:*** The continued involvement of key stakeholders throughout the project ensured timely completion and the ability to address issues flexibly as they arose. For example, one issue that came up was at the beginning of the agreement concerning the commencement of the Sewerage System and the payment due after the first six months from the municipality to the private developer. The period of operations performed and the payment claimed from the municipality did not have the required approval from the Pollution Control Board (PCB). The municipality worked closely and cooperatively with the private operator and the issue was eventually resolved with little push back[[9]](#footnote-9).

***Enabling Environment:*** Assistance from the other State public entities, the Chennai Corporation, and other sources, such as the USAID’s FIRE project, was critical. TNUIFSL and FIRE spearheaded the project structuring, managed the feasibility studies, and prepared the bid and contracting documents. The Chennai Corporation, along with many other sources, provided the review and approval of the engineering reports that also were essential for the success of the project[[10]](#footnote-10).

## China: Shanghai Zhuyuan No.1

**Project Overview**

By 2008, China had over 300 water supply and wastewater PPP projects, including joint ventures, concessions, and BOT contracts. Among these, one of the largest and most famous is the Shanghai Zhuyuan No.1 Wastewater Treatment Plant project (Zhuyuan), a greenfield development, with a treatment capacity of 1.7 million m3 per day, serving about 23.5 million inhabitants across an area of 107 square kilometers.[[11]](#footnote-11)The total amount of construction investment in the project was CNY 870M (USD 114M)[[12]](#footnote-12) which consisted of sponsor equity and bank financing from a domestic commercial bank. Zhuyuan is also worthy of investigation because it has one of the lowest customer tariff levels in the sector (.0266 USD[[13]](#footnote-13) per cubic meter of treated wastewater).

In 2002, the Youlian Consortium, with 85% private capital,[[14]](#footnote-14)consisting of Shanghai Youlian Development Company (45%), Huajin Information Investment (40%), and Shanghai Urban Construction Group (15%) both private companies,[[15]](#footnote-15)won the open tender for the project by bidding the lowest treatment costs.[[16]](#footnote-16)Shanghai Zhuyuan Youlian No.1 Wastewater Treatment Ltd. Co. was established as a joint venture project company and granted a 20 year concession by the Shanghai Water Authority. (Strictly speaking, Shanghai Zhuyuan No.1 WWTP Greenfield project is a quasi-BOT project, due to the fact that part of the investment comes from the government).[[17]](#footnote-17)According to the concession agreement, the Shanghai Water Authority (SWA)had to minimize its interference in plant construction, operation, and maintenance and limit its activities to safeguarding public health and safety. In turn, the private company was to receive a service fee from SWA for the construction, operation and maintenance services it provides in a quasi-BOT structure. The service fee depended on the investments and agreed performance levels, rather than on user fees. In 2005, Youlian Development Corporation exited the consortium (due to changes in financing policies in China), selling its 45% stake in the project company to InterChina Holdings, a Hong Kong listed company.[[18]](#footnote-18) Other members followed suite and now InterChina Holdings owns 100% of the project company.

**Noteworthy Outcomes**

The savings generated through the partnership are reflected in the service fee, which was over 50% below the government’s own cost projections of 6 cents per cubic meter. Indirect government subsidies via fixed investments and the land provided by government help to explain how both the service fee and user tariffs were so low.[[19]](#footnote-19)

**Key Success Factors**

***Appropriate Project Structuring:*** A balance between increased access to improved service and investment outcomes (IRR) was achieved, partly due to governmental subsidies to keep the wastewater tariff level down. The government provided land to the project company for free for the duration of the term of the project, reducing the capital expenditure incurred by the private company. The government also financed the early project development and design activities before the engagement of the private sector. The local government involvement in the project through initial stage development activities (valued at about $30 million)plus offering the project company the right to freely use the land during the term of the project reduced the project risk, which contributed to the low tariffs. Further, poor and disadvantaged residents were subsidized by the government and public hearings contributed to higher levels of legitimacy.

***Enabling Environment*:** The project team accelerated the establishment of a more favorable, systematic and comprehensive regulatory framework to replace the existing ad hoc, fragmented regulatory systems, which threatened efficiency in water service delivery and failed to appeal to foreign investors. Significant economic growth levels also enabled local residents to cope with some tariff increases.

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| **INFOBOX 1: Household Level Public Private Partnerships**  **Sri Lanka Case Study** |
| A team in Sri Lanka is exploring the use of five-year PPP arrangements between operators and households for desludging septic tanks. Under the model, for a small payment by the customer, an operator will go to a given household and perform the desludging. Once confirmed by the household, the operator can request additional payment from the water board.  The National Water Supply Drainage Board (NWSDB) will manage the competitive selection of the operators on behalf of the local authorities, which will be represented in the bid evaluation committee. One of the main objectives of such arrangement is to ensure that there is regular desludging. The task team proposed that the PPP agreements between the operator and the household be for a minimum of five years. Within those five years the operator will be required to regularly desludge the septic tank. The regularity of such desludging will be contingent upon the physical size of the septic tank and desludgings will be scheduled accordingly. For poor households who do not have access to the sewer network, Global Partnership on Output Based Aid (GPOBA) Grants will provide subsidies for the construction of toilets with septic tanks and for the partial cost of desludging these facilities for 2 years. Thus, an operator will return to a given household within a scheduled time (say 12 to 14 months) and, subject to a small payment by the customer, will perform the desludging of the septic tank. Upon confirmation by the household the operator can request payment from the water board/GPOBA.  Eligible households: The task team, with the assistance of the water board as well as the local municipalities, will focus on households where there are no existing sanitation facilities either in the form of a toilet or a septic tank. Locations with these characteristics will be given priority over other locations.  Revised unit cost: The mission has already worked with the NWSDB to estimate the unit cost. Although this will vary depending on the pilot areas identified and the type of intervention needed, an estimated average of $800 was determined as an appropriate benchmark. Such unit cost compares favorably to unit costs observed while developing the same facilities in India.  *Source: WSP, Sri Lanka: Output-Based Aid in the Wastewater Sector; World Bank Implementation Support Mission. August 21-29, 2014, Aide-Memoire* |

# Case Studies: Africa

## Egypt: New Cairo Wastewater Treatment Plant

**Project Overview**

New Cairo City is a satellite town of Greater Cairo, created to alleviate overcrowding in the capital. In 2006, New Cairo had a population of 550,000, with growth projections forecasted at four million over the next 20 years. This rapid population growth placed increasing pressure on already poor existing water and sanitation infrastructure.[[20]](#footnote-20)

In response to this pressure, in 2007 the Government of Egypt(GoE) launched the New Cairo City Wastewater Treatment Plant PPP project, the first PPP in Egypt. This was a somewhat challenging time for the infrastructure sector in Egypt due to recent unsuccessful private sector participation in the energy sector. To avoid making the same mistakes, the GoE launched the New Cairo project as part of a broader initiative to develop innovative infrastructure projects and promote infrastructure PPPs.[[21]](#footnote-21)

The government engaged the International Finance Corporation (IFC) to structure the New Cairo PPP using a design, finance, construct, operate, maintain and own or possibly transfer wastewater plant with a capacity of 250,000m3 per day.The government also engaged the World Bank Group’s Public Private Infrastructure Advisory Facility (PPIAF) to assist with preparation of the conceptual framework and transaction model. Key public sector drivers for this project were theneed to provide adequate sanitation to the city of New Cairo, mobilize private sector finance and technical expertise, and implement a successful demonstrative project that could be replicated elsewhere.

The IFC assessed and evaluated various options for engaging the private sector and worked with the PPP unit, together with the Ministries of Finance, Investments, and Housing to identify the best solution. The project was ultimately structured as a 20-year BOT in which the government pays quarterly sewerage treatment charges to the private partner. The charge consists of a fixed amount to cover fixed costs and a variable amount, based on volume treated, for variable operating expenses.

The selection process included a prequalification phase, during which prospective bidders were assessed for financial and technical eligibility. Bidding was organized in two subsequent steps: a technical bid evaluated on a pass/fail basis and a commercial bid limited to those who had ‘passed’ the technical round. The project attracted five bids from consortia comprised of local, regional, and international firms. A consortium of Egyptian firm Orascom Construction Industries (OCI) and Spanish firm Aqualia (also known as Orasqualia) submitted the lowest financial bid and was awarded the $482 million contract in June 2009.

**Noteworthy Outcomes**

The Orasqualia consortium financed the project fully, investing 30% in equity and securing 70%of the project cost (denominated in Egyptian Pounds) from a group of four Egyptian banks.[[22]](#footnote-22)The transaction mobilized the equivalent of $150-$200 million in private investment. The New Cairo plant was completed in March 2012 and offers a replicable model for future PPPs in Egypt and throughout the region.

**KeySuccess Factors**

***Stakeholder Participation and Coordination:*** The Ministry of Finance (MoF) was committed and capable throughout the duration of the project and had established a new PPP unit to coordinate this effort. The project was proactively managed by relevant stakeholders. During the procurement stage, 60 private sector parties expressed interest in participating in the project, with seven parties qualifying to bid. Ultimately, five parties chose to bid for the project.

A Performance Monitoring Committee was also established during this PPP as a dispute resolution mechanism. This Committee facilitated the partnership[[23]](#footnote-23)and consisted of one representative from the private sector, one from the tendering authority, and one independent expert agreed upon by both parties.

***Strong Local Counterparty:*** Although not a qualification criteria for bidding, the fact that the winning bidder was an established local company proved to be fortuitous in navigating and managing complex relationships with five different cabinet ministers who were parties to the contract. Despite the force majeure event of the Egypt revolution in 2011, the project was able to complete construction with relatively minimal delays.

***Transparent Procurement:*** There was a high level of transparency throughout the project. Knowledge around international PPPs and the wastewater sector combined with good international marketing and custom approaches to meet local market needs proved very successful[[24]](#footnote-24). The PPP Central Unit also appointed a number of skilled advisors to guide and facilitate the signing of the PPP, including Lead Transaction Adviser from IFC, and other technical consultants. Strong due diligence (legal, technical financial) was performed on all involved parties and terms developed, and there was a good understanding of the market.

***Appropriate Project Structuring***: Set against low appetite from investors, the New Cairo contract featured a number of demand and credit risk mitigation clauses. The ‘take or pay’ clause was designed so that the only portion of revenues at stake is the variable operating expenses paid against volumes treated, while the majority of fixed operating costs, debt service and return are covered as fixed payments. The Ministry of Finance also underwrites the off-taker utility for missed payments. Operating costs as well as financing costs were also indexed to specific measure. The contract included re-equilibrium clauses. These clauses outlined the possibility for the private operator to request a re-examination of sewerage charges in case costs increased or revenue decreased due to foreseen events decreased. The contract also foresaw compensation in the case of a force majeure, change in law and termination of the contract.

## Egypt: Sixth of October

**Project Overview**

In 2009, one of Cairo’s governorates, “The 6th of October” had a population of 500,000 and was growing rapidly. The area’s population was estimated to increase to 3.7 to 5 million people by 2039. In anticipation of this expected population boom, the Government of Egypt sought to expand its wastewater treatment capacity in this governorate.[[25]](#footnote-25)

In December 2010, the government invited bids for the design, construction, financing, operation, and maintenance of a new wastewater treatment plant with a capacity of 150,000 m3/day in the Sixth of October governorate. The budget for the 30-year project was $300 million.[[26]](#footnote-26)

Much thought was given to the procurement process, which involved: (a) broad dissemination of the opportunities to potential private service providers and investors in Egypt and abroad; (b) high quality project preparation with the assistance of external transaction advisors, lawyers and technical consultants; and (c) fair and transparent procedures for prequalification, investor due diligence and tender award. Under the PPP contract, the private awardee would receive periodic availability payments tied to the quality of delivery and performance, which would be regularly monitored and reported.[[27]](#footnote-27)

**Noteworthy Outcomes**

Although ten bidders prequalified, the government decided not to proceed with the project due to challengescaused by the large amount of industrial wastewater in the system requiring costly pre-treatment. In addition to these technical and cost issues, the project faced delays due to the political effects of the Arab Spring riots. The project was eventually cancelled in May 2012.[[28]](#footnote-28)

**Key Success Factors**

Although the project did not move forward, it did enjoy elements of success such as a strong market response. This was based largely on:

***Stakeholder Participation and Coordination:*** The contract had ten qualified bidders, demonstrating the private sector interest in wastewater PPPs.

***Appropriate Project Structuring:*** The need for strong technical, financial and legal due diligence prior to the start of the project was critical to ensure sustainability, or in this case, determine the unfeasibility of the costs.

## Senegal: ONAS outsources wastewater management

**Project Overview**

Senegal’s cities, including its capital, Dakar, have struggled to increase access to improved sanitation services to their poor urban and peri-urban communities. The Office of National Urban Sanitation (ONAS) provides services to about 15 cities in Senegal, mostly via a traditional system of sewage pipes and household connections. However, ONAS does not have all the means necessary to operate in densely populated, unplanned urban areas with limited infrastructure that require less conventional systems.

ONAS has decided to engage the private sector to improve access to sanitation services in Dakar and its outlying areas. A collaborative effort between ONAS, local communities and authorities, and technical consultants was launched and supported by the World Bank in 2013 to define and establish a mechanism for delegated management of semi-collective wastewater systems in unserved urban areas. In the new semi-collective system, ONAS will outsource wastewater collection operations and maintenance to private operators and collaborate with community municipalities to manage customers. This model, designed for urban and peri-urban slum areas with weak infrastructure and access challenges, features narrow wastewater pipes and partial connection to the traditional sewage system.[[29]](#footnote-29) The project consists of nine systems with 120 kilometers of piping, 1,366 manholes, 7 pumping stations, and 3 treatment stations with an estimated capacity of 5,300 m3/day. The project will serve 11,000 subscribed customers among a population of 150,000 in the area.

The Government of Senegal has made initial investments with support from technical and financial partners, expecting the project to earn about 10 million West African CFA (“Financial Community of Africa”)per month (equal to about US $21,000 once fully operational).This revenue projection is not expected to fully cover costs. Therefore the new system will depend largely on ONAS’ budget for funding, which is comprised of subsidies, donor funding, and a small levy on urban water tariffs. Thus far ONAS has established MOUs with eight municipalities and has launched the procurement process for selecting private operators.

**Key Success Factors**

***Stakeholder Participation:*** In the community-based model it was unclear who was responsible for certain financial responsibilities, such as payment for installations on private residential property. In the new model, customers pay for the instal­lation of their residential septic tank and pipe connections. Although customers of this system are among the poorest in urban areas, there seems to be enough demand for improved sanitation services to make the investment for household connections economically viable. This financial contribution from customers is necessary for the financial sustainability of the model, which is the only hygienic alternative to the status quo (open defecation or on-site collection).

***Capacity Building and Public Awareness:*** The new institutional model depends largely on the organizational capacity of ONAS to manage relationships with several stakeholder groups while also serving as the sector’s regulator and main source of financing. The GoS will need to ensure that ONAS is provided with training and capacity support to fulfill this crucial role.

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| **INFO BOX 2: Franchising Opportunities**  **The Sanergy Model : Kenya** |
| Sanergy is a private company in the business of building and scaling viable sanitation infrastructure in the slums of Nairobi. While this model does not represent a wastewater PPP, it does provide some relevant insights and could be leveraged to achieve scale in a PPP framework.  Sanergy’s model involves four steps: (i) building a network of low-cost sanitation centers in slums, (ii) distributing them through franchising to local entrepreneurs, (iii) collecting the waste produced, and (iv) processing it into electricity and fertilizer. At each step, this model creates jobs and opportunity while simultaneously addressing serious social needs.  The first part of the model is to build, and franchise a dense network of low-cost sanitation centers, eventually expanding to every block of the slum. These centers will be franchised to local entrepreneurs with direct financing from a local microfinance bank, and the day-to-day operation of the facility.  Rather than septic tanks, pit latrines, or sewer systems, the Ecosan system used in the sanitation centers deposits the waste in air- tight containers. These containers of urine and feces are collected on a daily basis by a waste collector using handcarts. Each day, Sanergy employees collect the full containers of waste from the operators and provide them with clean empty containers. The containers full of waste are brought to the central processing facility.  The processing facility will efficiently convert human waste into biogas through industrial-scale anaerobic digestion process. The residual solids will be processed into high-quality organic fertilizer, which will be sold to commercial farms and small hold farmers.  ***Key Takeaways****: Potential to use PPPs to scale - local governments could replace the entrepreneurs in paying for the upfront facility construction and operating the public sanitation facilities; Sanergy could also collect directly from homes as the private operator in an O&M PPP and receive a government subsidy levied on water or have government agree to purchase wastewater treatment outputs (fertilizer, energy, etc.)* |

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# Case Studies: South America

## Honduras: San Pedro Sula Project

**Project Overview**

San Pedro Sula, located in the northwest of Honduras, is the country’s second largest city and the economic capital. In 2000 the Municipality of San Pedro Sula (MSPS)awarded a 30-year concession to a private operator to operate the water and sanitation system in the city. The project included plans for the installation of meters, the expansion of the sewer system and the construction of wastewater treatment plants. Since this was structured as a concession, the municipality receives concession fees that serve as additional revenue for the municipality.

Three international consortia submitted formal bids for the concession. To ensure a transparent and competitive process, the municipality decided to award based on the lowest water tariff offer as a single criterion. The bids were revealed in public and the concession was awarded to an Italian consortium named Aguas de San Pedro (ASP), led by Acea, the water and sanitation operator for the city of Rome. Not only was Aguas de San Pedro’s proposed tariff the lowest, but it was also lower than the tariff charged by the municipal water company at the time.[[30]](#footnote-30) According to local independent consultants, rates in San Pedro Sula were among the lowest in all of Central America at the time.

The Aguas de San Pedro consortium committed itself to investing $208 million, with$115 million designated to water services and $93 million designated to sewerage services, over the 30-year concession period. Investments have been partially financed by a $13.7 million loan from the Inter-American Development Bank, approved in 2002.

It is important to note another key feature of the concession agreement. The Municipal Division of Water (DIMA) agreed to a departure from their traditionally static tariff system to grant ASP the right to adjust tariffs for inflation semi-annually and to make a single increase of up to 20%.[[31]](#footnote-31)

**Noteworthy Outcomes**

In response to initial public resistance to the installation of water meters, ASP launched a ‘Friendly School & Healthy Home’ program in 2006 in collaboration with UNICEF, the Ministry of Education, and MSPS in the hopes of improving its relations with the local public. The program, in which ASP has invested around $43,000 for the design and construction of new toilets and washstands, seeks to improve the sanitary infrastructure in eight urban and three rural schools across San Pedro Sula.[[32]](#footnote-32)

**Key Success Factors**

***Transparent Procurement Process:*** The municipality used an extremely open and consultative process to award the concession. A ‘Municipal Transparency Commission’ was established, consisting of representatives from civil society, including labor unions, the Dutch consul in Honduras, the Catholic Church and a local university. The Commission was responsible for overseeing procurement; it carefully reviewed all of the documents, at each stage of the process.

***Capacity Building and Public Awareness:*** MSPS and ASP could have possibly prevented the negative public reaction to the concession by investing more effort upfront in explaining and educating the public on the shift of service provision from DIMA to ASP and the specifics of the new metering system. Several other steps could have been taken to improve the project’s outcomes, including: conducting an in-depth evaluation of the impact of ASP’s social outreach efforts to improve them prior to installing new metering system; offering to finance the repair of leaky pipes in low-income households to quell suspicion about privatization; allowed low-income households with new connections to pay a fixed fee for the first few months to buy time to educate them on the consumption/volume-based tariff system.

## Ecuador: Quito Wastewater Project

**Project Overview**

In 1999, the Municipal Water and Wastewater Company of Quito started a $170million service provision upgrade project to extend access to improved water and sewerage to 600,000 residents. The work was supported by a loan from the Inter-American Development Bank (IADB)[[33]](#footnote-33). The following year the City of Guyaquil signed a 30-year concession PPP with Interagua (Bechtel) and ECAPAG as part of an IADB loan program.

The PPP contract makes the private contractor responsible for water treatment, transport, storage, delivery, and wastewater treatment. The private operators committed to investing $500 million over the 30 year concession period, connecting 55,000 new customers, and increasing water service coverage from 53% to 90% of the population. A surcharge on the customer fee is used to finance the sewerage extension.

**Noteworthy Outcomes**

The private operators, Bechtel in particular, have come under significant fire for what critics claim is non-compliance with the service terms of the PPP contract. Critics claimed that Bechtel had not begun to fulfill its contractual commitments and that there have been increasing complaints from customers of unreliable water service, broken pipes, etc.[[34]](#footnote-34) In 2005 advocacy groups such as the Observatorio Cuidadano de Servicios Publicos (Citizen‚ Observatory for Public Services) documented these apparent violations and called on the regulatory agency ECAPAG to fine Bechtel for US$1.5 million for non-compliance with its contractual obligations.[[35]](#footnote-35)

While the concession was under political pressure in 2009-2010, it is understood to continue to operate in a normal manner.[[36]](#footnote-36)

**Key Success Factors**

***Clarity in Operational Rules:*** The contract explicitly noted that any breach in operational rules that governs the relationship between the private operator and customers is liable to a fine of $5,000 per event. However, the agreement does not reference in which situation such a sanction should be imposed. For example, a lack of responsiveness to a customer complaint could be considered a complaint by the regulator, and the private operator could be asked to pay the fine. The agreement does not define what a customer complaint is nor does it explain the time the operators have to respond to such complains. The agreement also does not put a cap on the provision, so an operator could potentially have cumulatively millions of dollars in fines for not responding to customer calls. This shows a gap in the structure of the PPP arrangement for clarifying clauses for the $5,000 fine.[[37]](#footnote-37)

***Transparent Procurement***: Make sure the process is transparent and that all clauses are clearly outlined to prevent such situations as the breach in operational rules.

***Appropriate Project Structuring***: In this particular case study, operators were required to post monthly reports to their regulators. The frequency of these reports may be different between PPPs, as capacity and cost concerns may arise.

## Argentina: Salta Wastewater PPP

**Project Overview**

In spite of its location in a poor province of Salta in Argentina during a period of severe economic crisis, the case of Salta’s wastewater concession provides an example of a successful PPP. In 1982 the responsibility of providing water and sanitation services shifted from the purview of the national public utility company to provisional governments. This decentralization of service provision allowed each province to focus on addressing their specific needs in their own ways. Many chose a combination of public and private service providers.[[38]](#footnote-38)

The Salta province began its water sector reform in 1996 prompted by the local sector’s low coverage and poor performance related to limited management capacity and investment. Specifically, prior to the reforms the General Water Administration Authority (AGAS in Spanish) provided water and sanitation services to 43 of the province’s 58 municipalities, with a 68% coverage rate for sewage in those 43 areas.[[39]](#footnote-39)As part of the reform, the power to delegate water and sanitation services was transferred from the legislative to the executive branch of provincial government. Once this shift was made, the water company, AGAS, was put on sale through an international procurement process for a concession contract, which was awarded to Aguas de Salta S.A. (ASSA, later called SPASSA) in 1999. Ultimately, the shares were transferred to Latin Aguas, S.A., which operates two other concessions in Argentina.

The PPP was largely driven by the goal of reaching universal coverage, so the concessionaire was supported by the Provincial Government and the independent regulator to make the necessary steps towards the achievement of this goal. What makes the Salta case unique is that not only did the PPP focus on universal coverage, but there was also a focus extending services to poor populations within the province and practical tools, including a targeted, government sponsored subsidy plan and a menu of permissible service levels, were deployed towards this end. Not only did the Provincial Government support these goals by investment funds from its own budget, but it also approved a series of tariff increases to allow the concessionaire to reach financial equilibrium. Salta is one of the few provinces in Argentina that has, since the economic crisis of 2002, benefitted from a ‘virtuous cycle’ of improved service, increased political will to invest, and increased tariff levels, with public subsidies for poor users.

The Provincial Government’s funding of subsidies for low-income customers is a crucial part of the partnership. The government’s eligibility requirements for the subsidy include income, housing characteristics, household size and the number of students in the household. Controls within the application process ensure only low-income households benefit from the subsidies.

**Noteworthy Outcomes**

As a result of the concession, the provider expanded service to additional municipalities. The number of municipalities served by the concessionaire increased from 43 to 56 municipalities by 2005, sanitation coverage increased for 54% to 84%, and 95% of wastewater collected was treated. Service quality improved drastically; the percentage of people negatively affected by interruptions decreased from 32% to 8%. Lastly, the company also improved its billing and customer service by combining its revenue collection with that of the electricity company to reach a collection rate of 90% and by establishing a toll-free customer service line.

**Key Success Factors**

***Appropriate Project Structuring:*** The Salta PPP contract is flexible in three ways: 1) it encourages collaboration between stakeholders; 2) It allows for evolving user and local government priorities to be integrated into the PPP framework; 3) it allows the concessionaire to negotiate with the regulator regarding expected service levels to unprofitable areas. In Salta, the regulator has the authority to grant temporary waivers, lowering service delivery standards for the concessionaire, in periods of economic strain. This fairly rare level of flexibility allowed the Salta PPP to overcome the tumultuous 2001-2002 economic crisis.

***Stakeholder Participation and Coordination:*** The concessionaire, SPASSA, is a local utility with limited previous experience in water and sanitation services. The Provincial Government made a deliberate decision to value local knowledge and experience over previous sector experience in the procurement process based on its belief that a local company could be more responsive to and in tune with the region’s socio-political context. In order to ensure that the local candidates would still have the ability to meet all of the technical needs of the sector, the Government required that all local candidates seek technical assistance from a qualified regional water service provider at the beginning of the partnership. This model was successful as the local concessionaire was able to develop its water and sanitation abilities and leverage its local expertise to meet the terms of the contract and even win additional concessions in Argentina and Peru.

Further, after the contract was signed, the concessionaire, SPASSA, and the regulator, ENRESP, agreed on the importance of engaging local governments for the local delivery of sanitation services although this was not a requirement of the contract. SPASSA and ENRESP developed a strategy for cultivating relationships with local government stakeholders, including holding public meetings with municipalities and user associations. The concessionaire also entered into agreements to provide technical assistance, while municipalities and user associations provided low-skilled workers and materials, to extend the service networks. Between June 1999 and July 2002 seventeen of these agreements were signed between the concessionaire and municipal government and three were signed with user associations for areas where municipal governments were less active. This proactive engagement of the local governments not only helped the concessionaire meet its goals of expanding local service, but also believed to have helped quell some of the local populations’ concerns about PPPs. Also, the Provincial Government’s stability and continuous investment in the low-income subsidy and the investment programs were factors in the concession’s success.

This PPP also benefitted from Salta’s well-established provincial-municipal governmental coordination mechanisms, including a Joint Working Commission for trouble-shooting between contract parties.[[40]](#footnote-40)

## Brazil: São Paulo Water Recovery Project (REAGUA) from 2008–2015

**Project Overview**

São Paulo is the most populous of Brazil’s states; in 2008 its population had reached 41 million people, with 38.8 million living in urban areas. This population growth exacerbated the State’s already limited water and sanitation service delivery. Within the State’s urban population, 4.8 million people were not connected to a public sewerage system, 2.5 million people lacked adequate sanitation, and 15.7 million people had wastewater collection but no treatment in 2008. The limited reach of the sanitation, sewerage and wastewater treatment systems added to the State’s existing pollution and water scarcity challenges. These challenges were and continue to be especially acute in low-income neighborhoods close to major water reservoirs and rivers.[[41]](#footnote-41)

The World Bank’s Sao Paulo Water Recovery Project (REAGUA) was developed to improve the quality and availability of water in the state’s crucial watersheds by installing or expanding sewage treatment systems and cleaning up polluted waterways. The project was launched in 2008 with a bank loan of $64.3 million and counterpart funding of $43 million to cover the estimated total project cost of $107.5 million until the close date in November 2015.[[42]](#footnote-42)The project aims to support 24 public water utilities. To date, 20 utilities are benefiting and approximately $5 million had been disbursed by February 2014.[[43]](#footnote-43)

The project is composed of three major tracks of activity:

1. Increasing water availability – Includes the controlling and reducing water losses and launching a water use awareness campaign in 170 public schools.
2. Enhancing water quality – Includes the installation of 4,700 new sewerage connections, laying 118km of pipeline and building 17 wastewater treatment plants. Low-income households will make up the majority of those connected to the new wastewater systems since most well-off families are already connected to existing systems and the project’s selection criteria will target poor municipalities[[44]](#footnote-44)
3. Institutional and technical capacity development – Includes technical assistance to strengthen the sector’s institutional, legal and regulatory framework.

The project is financed using Output-based Disbursement (OBD) in the form of public subsidies to service private providers, part of which are funded by a loan from the World Bank/ International Bank for Reconstruction and Development ( IBRD). The funds are only disbursed upon verification of outputs, such as the completed wastewater treatment plant, linked directly to outcomes, like cubic meters of treated wastewater. Specifically, payments are triggered by the following types of outputs: reuse of treated wastewater, expansion of wastewater collection network, development of the wastewater transport system, and construction or renovation of wastewater treatment plants. This mechanism gives incentives for service providers to develop more cost-effective solutions for serving the poor. The Global Partnership on Output-Based Aid (GPOBA) also supported the project through technical assistance and expertise.

**Noteworthy Outcomes**

Specific wastewater targets, as well as the current status for each, are listed in the table below:[[45]](#footnote-45)

**Table 2: REAGUA Targets and Current Status**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Target | Baseline | Current Status | Target (11/2015) | Percentage Achieved |
| Cubic meters of recovered water | 0 m3 | 2,407,425 m3 (12/2013) | 30,106,311 m3 – *Note: Plans to increase target to 32,211,830* m3 | 8% |
| Cubic meters of wastewater reused per year in selected activities | 0 m3 | 0 m3 | 938,727 m3 | 0% - *Note: Currently under implementation; awaiting results.* |
| Additional cubic meters of wastewater treated, effluent in accordance with norm | 0 m3 | 1,123,680 m3 (10/2012) | 19,793,513 m3 – *Note: Plans to increase target to 22,791,986* m3 | 6% |
| Number of people in urban areas provided with access to improved sanitation under the project | 0 | 0 (12/2013) | 200,000 people | N/A |

**Key Success Factors**

***Appropriate Project Structuring:*** While this project is still active and has not achieved all of its targets yet, the transparent OBD model makes it easy to understand the project’s indicators and track progress towards defined goals.

# Case Study: Europe

## Croatia: Zagreb Wastewater Treatment Plant

**Project Overview**

The Zagreb Wastewater Treatment Plant project was implemented in 2004 with the goal of improving water quality in the River Sava catchment area to reach EU standards. The project, led by the European Bank for Reconstruction and Development (EBRD), was structured as a 28-year BOT concession with a total project cost projected at 290 million Euros.

The private operator, Zagrebacke Otpadne Vode (ZOV)[[46]](#footnote-46), is an SPV that is owned by a consortium consisting of RWE Aqua GmbH (48.5%), a subsidiary of the German utility RWE AG, and WTE Wassertechnik (48.5%), a subsidiary of the Austrian utility, EVN AG and Vodoprivreda Zagreb (3%), a municipal company of the city of Zagreb. The project concession was awarded in December 2000 and the project reached financial close in December 2002.

For the project, ZOV was able secure55 million Euros from EBRD, which was co-financed by a 115 million Euro loan from the German bank KfW. Additionally, the two co-arrangers that joined the financing in the EBRD B-loan, Dexia Credit Local and Bank Austria, each contributed 10 million Euros. The project sponsors contributed 42 million Euros to the project with the remainder of the project costs being covered from the cash generated from the phased completion of the project.

In addition to the construction and operation of the plant itself, the awardee was also responsible for the construction (but not the design or operation) of supporting infrastructure (ex: access road, collection pipeline, cover for a drainage canal, bridge).

**Noteworthy Outcomes**

Though all parties involved seemed to agree on the need to improve water quality in Zagreb, concerns have been raised over the cost of the project, which seem to have risen without clear justifications for the increase. While the City Assembly agreed on a total cost of EUR 176 million in 2001, the project was expected to cost EUR 290[[47]](#footnote-47)million by the time of financial close. By the end of 2007, the total cost was reported at EUR 326.7 by EBRD.[[48]](#footnote-48) Furthermore, by the end of 2006 the sum of the monthly service fees that the City of Zagreb had paid to ZOV was equivalent to about 76 percent of the fixed plant construction costs. This raised questions and suspicions with the local community on why the city chose to go the PPP route instead of financing the project through normal public procurement methods.

According to a Commission of Experts established by the Zagreb City Council, the design of the project was unsuitable to the then state of the sewage system and drainage conditions of Zagreb. The Commission also provided recommendations to amend the situation including, analysis of the sewerage system, separating streams from drainage for improved function of the treatment equipment, installation of a simple and cost-effective mechanical system, and the construction of a retention system to prevent storm water overflow. The Commission’s recommendations were not adopted and the commission later disbanded.[[49]](#footnote-49)

Overall, many felt that the project was oversized and overpriced and had done more damage than good for the residents of Zagreb. Tariff rates for both industrial and households have increased by more than 200% since 2004, which has generated a lot of discontent with the local community. When industrial customers refused to pay increased fees to cover some of the project costs, city authorities turned to taxpayers to fill this gap.

***Key Weaknesses***

***Lack of Transparency:*** This project is a good example of a situation where very low levels of transparency resulted in a lack of community buy-in and suspicion. Though there is little public information into the actual risk and cost calculations undertaken by ZOV, the financial institutions and the City council, it is clear that the Zagreb City Council failed to effectively communicate the rationale behind their risk allocation decisions with the affected stakeholders. Similarly, it is of little surprise that the lack of satisfactory explanation to justify the increasing project costs raises suspicion among residents.

***Stakeholder Participation and Coordination:*** It seems that this project was designed based on a poor initial assessment of the existing systems, stakeholders, and willingness of customers to pay. The poor assessment led to an ill-fitting design, cost structure and risk allocation.

|  |
| --- |
| **INFOBOX 3: An Example in Inclusive Design**  **The Metro Manila Case Study** |
| Serving low-income areas is a common challenge among both water and wastewater PPPs due to several constraints, including the fact that these areas are often unplanned, have weak infrastructure (unpaved roads, leaky pipes), the low ability and/or willingness of customers to pay for services, a and the need for public education due to a prevalent distrust of the private sector, among others. As a result, poor customers are often completely left out of PPP design considerations.  One exception is the Manila Metropolitan Waterworks and Sewerage System (MWSS)PPP, a large concession agreement with specific language on how to make services available to the poor. The proactive pro-poor considerations were likely due to the very high-density populations of low-income customers in the areas affected by the concession. In this case, there would have likely been severe political consequences for not addressing these customers. This is a large reason why many PPPs in urban areas do not succeed (ex: Mumbai did not include poor and did not get political support).  Therefore, the Manila concession included specific clauses that addressed the needs of poor customers, which became a large success factor. PPPs like the Manila concession can be used to increase service coverage of poor areas, possibly using an innovative service approach incentivizing private providers to service a poor area in exchange for the right to service a wealthier area. For urban sanitation, it may be even better to promote poor inclusive initiatives rather than pro-poor investments so that plans and investments are city-wide  Regardless of what they are, features of an effective pro-poor PPP for basic urban services need to be considered and built in from the start. Specific lessons and insights from the Philippines project include:   * Septage management and sewerage tariffs should be pro-poor: combined water supply and sanitation fees should generally not exceed 5% of the average monthly income of residents; * Commercial, industrial, institutional, and agricultural dischargers should pay proportionally more for sanitation services based on the volume and pressure of the wastewater discharged to encourage conservation and pre-treatment of high pressure wastewater. * Homeowners with larger septic tanks that require multiple loads for desludging should pay more for desludging services than homes with smaller tanks requiring only one load. * When possible, septage tariffs should be structured so that there is a small surplus above full cost recovery. This can be used to build up a fund for future sewerage services or can be used by the local implementer to provide related services to the poor, including constructing and updating septic tanks and providing emergency response to septage spills as needed. |

# Summary of Key Success Factors

In spite of relatively low private sector participation within the wastewater sector (compared to other sectors such as power and transport), we have been able to identify ten cases from around the world that provide some insight into key factors that drive the success or failure of wastewater and sewage treatment PPPs. Many of the highlighted PPPs have been at least partially successful or exhibit indicators of early success. In the case of the Alandur project in India, sewerage access was extended to an additional 43% of the population, there was a leveraging of an effective fee system, bill collection improved, affordable financing was offered to customers, and 29% of project costs were covered by public investment. Even the less successful projects offer lessons into what to avoid or prevent in wastewater PPPs. In Ecuador and Croatia, the lack of transparency and stakeholder buy-in threaten the future of the projects. In Egypt, the 6th of October project was cancelled due to higher than anticipated projected costs (as well as political instability which is beyond the project’s control). Based on the lessons from both the successes and the failures, it is clear that appropriate project structuring, stakeholder engagement, and transparent procurement processes are amongst the most vital elements of a successful wastewater PPP experience. These key success factors, and two others that also appear to commonly apply to better performing wastewater PPPs, are listed in order of prevalence in the table below:

**Table 3: Key Factors highlighted in Ten Global Wastewater PPP Case Studies**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| KeySuccess Factors  *(In order of prevalence)* | India | China | Egypt/NC | Egypt/ 6th | Sen. | Hond. | Ecua. | Arg. | Brazil | Croatia |
| Appropriate Project Structuring |  |  | **X** |  |  |  |  |  |  | **X** |
| Stakeholder Participation and Coordination | **X** |  |  |  | **X** |  |  |  |  |  |
| Transparent Procurement | **X** | **X** |  |  |  |  |  | **X** |  |  |
| Enabling Environment | **X** | **X** |  |  |  |  |  |  |  |  |
| Capacity Building and Public Awareness |  |  |  |  |  |  |  |  |  |  |

# Recommendations Looking Forward

While the ten cases highlighted in this study do provide some effective practices, they also demonstrate the lack of a consistent or standard approach for urban utilities seeking to expand access to wastewater treatment and sanitation services to traditionally underserved, low-income customers.

In this context, some useful recommendations can be gleaned for policy makers who wish to design programs that target and serve low income customers. The most consistent theme with all the successful projects was the **utilization of transparent procurement procedures**. Projects whose procurement is transparent have generally faced less resistance from the communities while those that were sole sourced were generally blighted with corruption accusations. Even in the cases where the corruption accusations could not be substantiated, the private operator would lose credibility with customers generally leading to customers’ unwillingness to pay for services.

The Alandur case demonstrates that **treating low income customers as stakeholders** can build goodwill and support for the project. The willingness-to-pay study that was commissioned assisted the developers and financiers in properly structuring the project. Developers were able to more accurately determine the customer risk profile sand willingness to pay upfront and could therefore structure the project to cover the developers in case projections were not met. Additionally, since low income customers were included from project conception, their inclusion added to the transparency of the process, and consequently, the municipality could ask members of the community to contribute to the capital expenditure program.

Another common thread through all the successful low income targeting projects was the fact that **contracts(e.g., concession agreements) explicitly highlighted that increasing coverage to all sectors including the low income sector was paramount to the project**. The public sector did not assume that coverage would automatically increase with the engagement of the private sector. It needed to be included as a contractual obligation.

Finally, there needs to be **clear political will and impetus** in order to promote and defend the project, and its attempts to expand access among the underserved. As the Alandur case demonstrated, the presence and drive of the chairman with legitimacy with the local community was a factor in its successful implementation. The South America case studies indicate that a catalyzing situation can also be helpful, a form of burning platform, to enable politicians to make difficult decisions that might be unpopular. However, as the Croatia case indicates, the presence of political will, as well as the burning platform (in the form of EU regulations) might not be enough if the process isn’t performed transparently.

As PPP projects continue to be launched within the wastewater sector in the developing world, (such as those shown in Table 4), there is ample opportunity to apply the lessons from these case studies and build on the existing body of knowledge.

**Table 4: Other Wastewater PPP Projects in Process**

| City, Country | Project Name | Public Entity | Private Entity | Project Value (US$) |
| --- | --- | --- | --- | --- |
| Manila, Philippines | Metro Manila Wastewater Management Project (MWMP) | Government of the Philippines | Manila Water Company, Inc. (MWCI) | $275 million |
| Jakarta, Indonesia | Zone One of SKI Jakarta Sewerage Treatment Plant | Ministry of Public Works | Jakarta Sewerage | $174 million |
| Aurangabad City, India | Underground Sewerage Scheme in Aurangabad City | Aurangabad Municipal Corporation | Aurangabad City Water Utility Company Limited and Urban Infrastructure Development Scheme for Small and Medium Towns | $144 million |

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