

## Tangerang, Indonesia

(Date of Tracer Study: December 2016; Tracer Study Team: A. Rubenecia; V. Neumeier; R Baoy)

### Project Background

Tangerang City is located in the province of Banten, about 25 km west of Jakarta, Indonesia. With the urban expansion of Jakarta, Tangerang has grown to become the third largest largest urban center in the Jabotabek region after Jakarta and Bekasi. Currently, the city serves as an industrial and manufacturing hub and home to over 3,000 factories. In 2006, Tangerang was declared as the Dirtiest City of Indonesia. The lack of solid waste management (SWM) resulted in low collection coverage and irregular collection services, soil contamination, open dumping and burning of garbage. A large number of residents had to suffer from the negative effects of garbage-induced air pollution. This prompted city officials to rise up to the challenge of positively changing the city's dubious reputation.

#### Box 8: Tangerang Project Overview

<b>PFS period</b>	June 2013 – November 2013
<b>Focus sector</b>	Solid waste management
<b>CDIA - supported activities</b>	- Review of existing SWM studies - Review of detailed FS of DED of Rawa Kuching landfill - PFS of integrated SWM system
<b>L2F Status</b>	Funded by the National Government

At the request of Tangerang City, CDIA carried out a detailed pre-feasibility study on SWM to complement the efforts taken by the city to address its growing SWM problems. Conducted from June to November 2013, the PFS activities aimed at achieving the following objectives: i) review of existing SWM studies and appraisal of existing SWM systems in Tangerang from collection to final disposal; ii) review of the detailed feasibility study and detailed engineering design for the rehabilitation and upgrading of the city's existing Rawa Kuching sanitary landfill; and iii) preparation of PFS for the most appropriate solid waste treatment technology for the City. Consistent with these objectives and in line with the City's SWM Master Plan, the CDIA-commissioned PFS team recommended a sustainable and integrated SWM system consisting of the following investment options: i) Collection and Transportation; ii) Material Recovery Facilities; iii) Intermediate Treatment Facility; iv) Landfill rehabilitation and engineering development .

### Solid Waste Management Project: Progress as of 2016



Fig. 15: Geo-membrane technology currently in use at the Rawa Kuching landfill site.

In 2013, the City of Tangerang began implementing the PFS recommendations by investing US\$ 2.3 million for the rehabilitation of the Rawa Kuching sanitary landfill. By 2015, the city has established 1,000 waste banks and revitalized the sanitary landfill. More than two hectares of land at the Rawa Kuching disposal site were turned into a green space for the public to exercise and relax in while learning about plants and recycling. Other facilities were established such as a greenhouse, a mini football field, a fish pond, a jogging track, a mini garden and a waste recycling site.

The waste collection and transportation system recommended in the PFS was adopted and implemented by the city. Households in low and middle income communities were provided with garbage bins for segregated collection of organics and inorganics Segregated garbage are collected by three-wheeled motorbikes then transferred to garbage trucks (current inventory is 200) that transport

the garbage to an intermediate collecting facility before final disposal at the sanitary landfill. To increase public awareness and engagement, social events such as a waste festival were held to complement community-based waste segregation schemes. Currently, some 2,000 persons are employed by the city as waste pickers, waste collectors, truck drivers and office workers. Quantity of garbage collected, transported, processed and disposed in the landfill site is estimated at 1,000 tons per day.

Encouraged by the positive results of local SWM initiatives, the Government of Indonesia issued two Presidential Decrees in 2016 aimed at accelerating the development of waste to energy plants in major cities of Indonesia including Tangerang. From being labeled previously as the dirtiest city, the city's efforts to improve its waste management enabled them to win the Adipura Kencana (Clean and Green) City Award from the Indonesian Government five times – from 2012 to 2016. With US\$7.2 million additional budget provided by the national government in 2016, the city will expand the landfill facility by constructing a 6 ha sanitary cell with a leachate treatment plant. Moreover, the city will pursue the waste-to-energy project component recommended by the PFS targeting 10 megawatts of electricity out of 1,000 tons of waste disposed in the landfill. This component is proposed to be funded through PPP arrangements as recommended in the PFS.

### **Intervention Results**

**Promoting investments in SWM.** Over the last three years, the PFS on SWM supported by CDIA in 2013 has been instrumental in promoting public investments in SWM. These investments have generated significant positive impacts to the city as solid waste collection, transportation and disposal infrastructure got implemented and as quality of SWM service began to improve. Positive impacts are expected to be felt in most parts of the city as service coverage and collection rates increase, improvements in landfill operations are realized especially from the expansion of landfill capacity, and as larger waste volumes are treated through appropriate technology solutions.

#### **Perceived impacts from improved SWM services.**

Gradual improvements in SWM services are perceived to have brought about positive impacts to the communities in terms of reduced pollution, better air and water quality and reduced health risks especially among poor households who are more exposed to open dumping practices. Improved SWM practices such as adoption of the 3R (reduce-recycle-reuse) approach have minimized waste generation rates at the household level resulting in reduced collection, transportation and disposal costs and extended life of the sanitary landfill. Moreover, economic benefits have accrued to some 2,000 people employed by the city as waste pickers, waste collectors, truck drivers and SWM office workers and about 200 households earning from sorting and selling of recyclables through the waste banks.



Fig. 16: Weighing of recyclables in one of community-based waste banks in Tangerang.

### **Conclusion and lessons learned**

Overall, this tracer study has proven that the detailed PFS on SWM supported by CDIA back in 2013 brought positive benefits to Tangerang City in terms of revitalizing its SWM plan, generating additional investments to improve waste collection, transportation and disposal and improving the quality of its SWM services.

Undoubtedly, the SWM awareness, education and outreach program initiated by the city was pivotal in mobilizing community participation in key components of the integrated SWM approach espoused by the PFS such as waste segregation at the household level and local waste banks.

Moreover, having a clear vision on how to deal with the SWM problem at the outset, one which is shared by all stakeholders, was a key element in reaching consensus of how to solve the SWM problems faced by the city, ensuring the success of implementing the various components of the SWM program and increasing the probability of achieving the desired results and impacts of an integrated SWM program envisaged by the city.

Finally, the CDIA experience in Tangerang highlighted the need for CDIA to properly manage city expectations about the nature and extent of CDIA intervention. At the outset, it should be made clear to partner cities that CDIA intervention is carried out within a limited timeframe and that linking the completed PFS to financing is largely dependent on the willingness of the PFS-identified downstream financier to bring the project forward to the next phase.

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