

## Waste Management in Japan and Malaysia: Centralise or De-centralise?

**A**ssociate Professor **Dr Kohei Watanabe** of Teikyo University Japan is a Senior Fellow with The Nippon Foundation's Asian Public Intellectuals' Fellowship Programme and a Research Associate at the Malaysian Commonwealth Studies Centre, University of Cambridge. On 11 September 2014, he spoke at an ISIS International Affairs Forum on waste management approaches opted by Japan and drew out lessons learnt from case studies, which can be applied in Malaysia. The Forum was moderated by **Dr Hezri Adnan**, Director for the Technology, Innovation, Environment and Sustainability (TIES) Programme, ISIS Malaysia, and the discussant was **Mr Mohd Rosli bin Haji Abdullah**, Director General of National Solid Waste Management Department (JPSPN). ISIS Researcher **Ms Michelle Kwa** reports.

**Dr Kohei Watanabe** offered his insights to reconcile the operational efficiency of both centralised and decentralised municipal waste management systems, and equity derived through local democracy and participation in general.

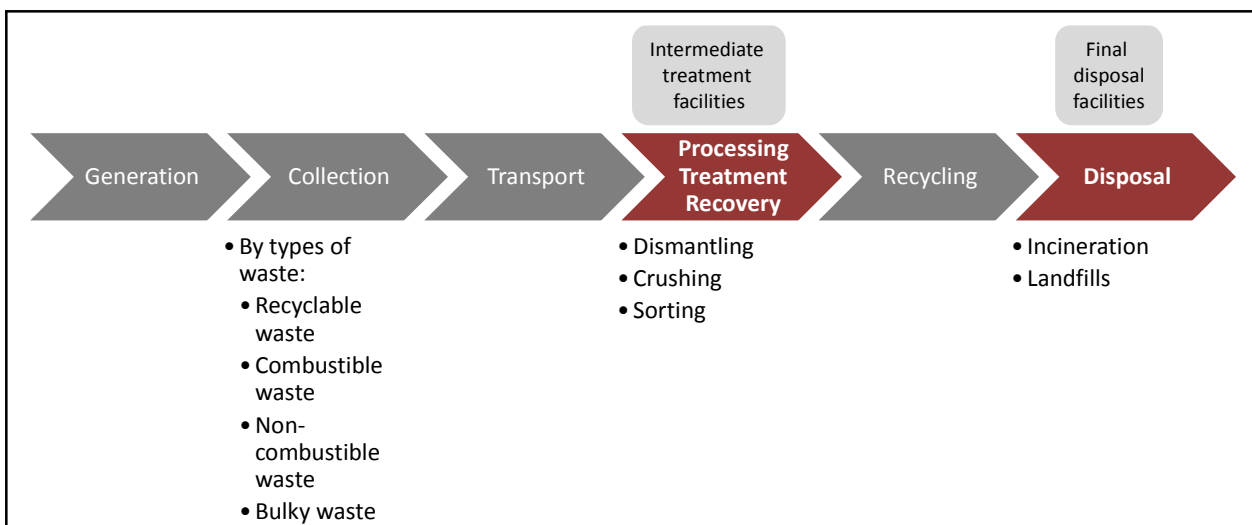
He first drew upon the basic systems for waste management in Japan according to the Waste Management Act of 1970 — municipalities are responsible for managing municipal waste while it is the responsibility of waste-generating business operators to manage industrial waste. Against this notion, Watanabe's talk was targeted to address municipal waste. Notably, a decentralised system in the Japanese context refers to a smaller facility serving a smaller area while a centralised system is classified as a bigger facility serving a larger area. The issue tackled was the extent of the municipalities' involvement in their service area instead of the convergence of

national and local waste management regulations. Figure 1 provides an overview of waste process classification.

### War on waste

The landscape of waste management in Japan, by and large, is deeply rooted in the principle of local self-sufficiency. Historically, this scene was largely catalysed by a waste conflict between Koto and Sugunami wards<sup>1</sup> back in 1971 in Tokyo (Figure 2). Koto Ward blockaded waste from Sugunami Ward into their overloaded landfill sites. The situation reached a deadlock when residents of Sugunami Ward opposed the construction of a new incineration plant (Suginami Incineration Plant) to treat the waste originated in their ward, prompted by fears over toxic emission from incineration plants. After a period of long negotiations, public engagements and

**Figure 1: Landscape of Waste Management in Japan**



Source: Adapted from Dr Kohei Watanabe's presentation

**Figure 2: Mayor Minobe declared “War on Waste” in 1971**



*Source: Dr Kohei Watanabe's presentation*

consultations, local residents ultimately accepted the “waste disposal in one’s own ward” ethic, reinforcing the principle of self-sufficiency of waste facility (each ward should have one incinerator). This policy rectified the social “NIMBY-ism” (Not In My Backyard) syndrome attributed to illegal dumping and shortages of landfill sites amid rapid economic growth. Reform of this waste disposal impasse was fundamentally driven by the local community who gave precedence to neighbourhood cleanliness and environmental protection. In the case of “War on Waste” in Tokyo, the public acceptance is deemed imperative to leverage the social costs of waste disposal and environmental inequality between wards.

### **Small is beautiful – decentralised system in Japan**

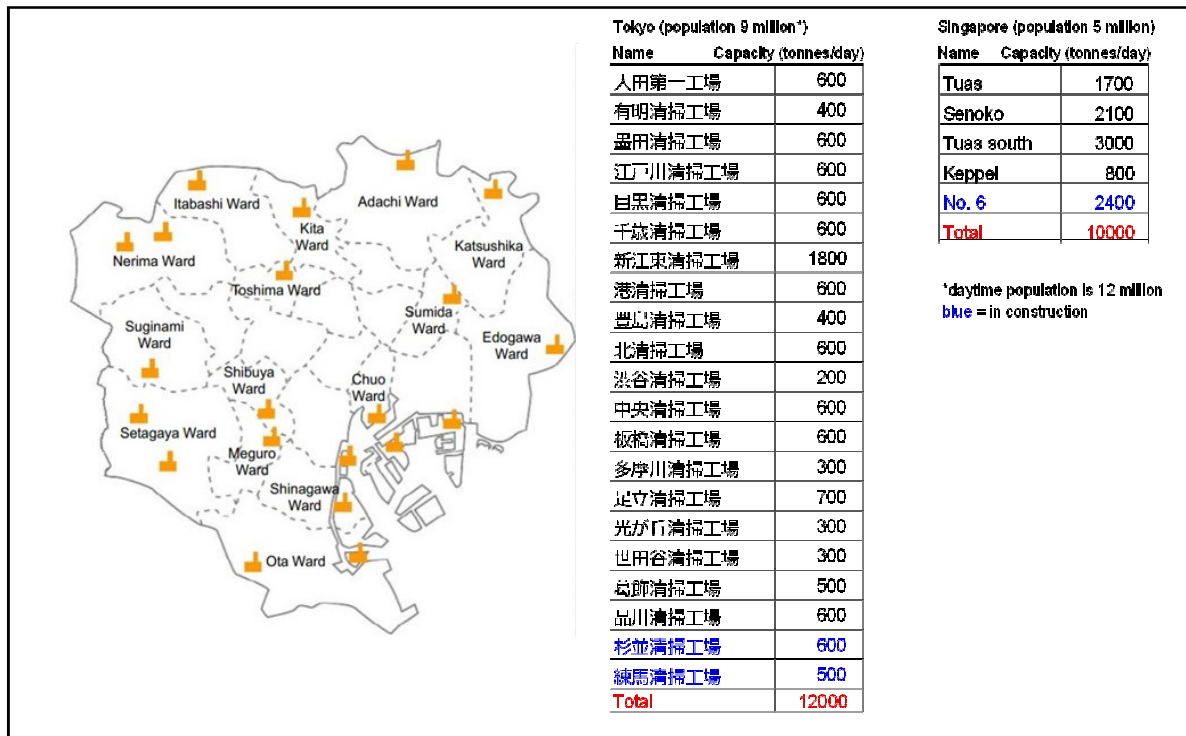
To safeguard the interest of the citizens, Tokyo has evidently adopted a more decentralised system (Figure 3). Although a decentralised waste management is seen as most relevant in the Japanese context, it is arguably not the most economically viable option. Against this backdrop, Watanabe further discussed the rationale and constraints of applying the local self-sufficiency principle.

First, Japan is facing land scarcity issues especially in conurbation areas. Hence the final

disposal at landfill sites is difficult in highly urbanised areas. Second, a stringent requirement is imposed on the emission standard as well as the efficiency of advanced incinerator with energy recovery. For an instance, an incinerator with waste-to-energy (WtE) demands a capacity of at least 500 tonnes a day (a population of one million inhabitants) in order to achieve high energy efficiency. Presently, only 304 out of 1,221 incinerators in Japan generate electricity from waste of which only 16 facilities exceed 20 percent efficiency. Operation costs for sanitary landfills on the other hand are too high for a single rural municipality.

Third, monitoring of increasing waste flow under the management of Extended Producer Responsibility<sup>ii</sup> (EPR) is posing a challenge to the local authority. This is due to the fact that producers operate across local boundaries. As such, it is difficult to track movement of recyclables (waste). A viable measure taken to address this limitation is through the establishment of special-purpose local authorities, such as Joint Waste Management Authority (JWMA) and Wide-Area Service Union (WASU), which allow members to vote in the committee.

**Figure 3: Comparison of Tokyo’s Decentralised Waste Facilities with Singapore’s Centralised Waste Facilities<sup>iii</sup>**



Source: Image retrieved at [https://www.kankyo.metro.tokyo.jp/en/attachement/waste\\_management.pdf](https://www.kankyo.metro.tokyo.jp/en/attachement/waste_management.pdf); Dr Kohei Watanabe’s presentation

**Operational challenges of centralised system**

Interaction and coordination of different collection and treatment bodies — collection by city, and treatment and disposal by JWMA — are hampered resulting from low transparency and uneven shared-responsibilities. Also, conflicting interests of various parties in the waste

management chain lead to policy disintegration. For instance, while incinerator operators rather burn plastics due to its high calorific value for electricity generation, collectors want to recycle plastic for income generation. Such policy incoherence ultimately fails to incentivise waste reduction. Table 1 gives a summary of the advantages and disadvantages of a centralised

**Table 1: Pros and Cons of Centralised System**

| Advantages of Large Facilities   | Disadvantages of Large Facilities  |
|--|--|
| <ul style="list-style-type: none"> <li>◆ economy of scale</li> <li>◆ ease of pollution control</li> <li>◆ efficiency of waste to energy</li> </ul> | <ul style="list-style-type: none"> <li>◆ less resilience, longer distance to transport, road congestion</li> <li>◆ distance between benefit-ers and disbenefit-ers</li> <li>◆ lack of sense of ownership of the facility</li> <li>◆ lack of civic awareness as citizen becomes “consumer” of waste services</li> <li>◆ lack of incentive to reduce waste</li> <li>◆ reduced opportunity for citizen participation</li> </ul> |

Source: Adapted from Dr Kohei Watanabe’s presentation

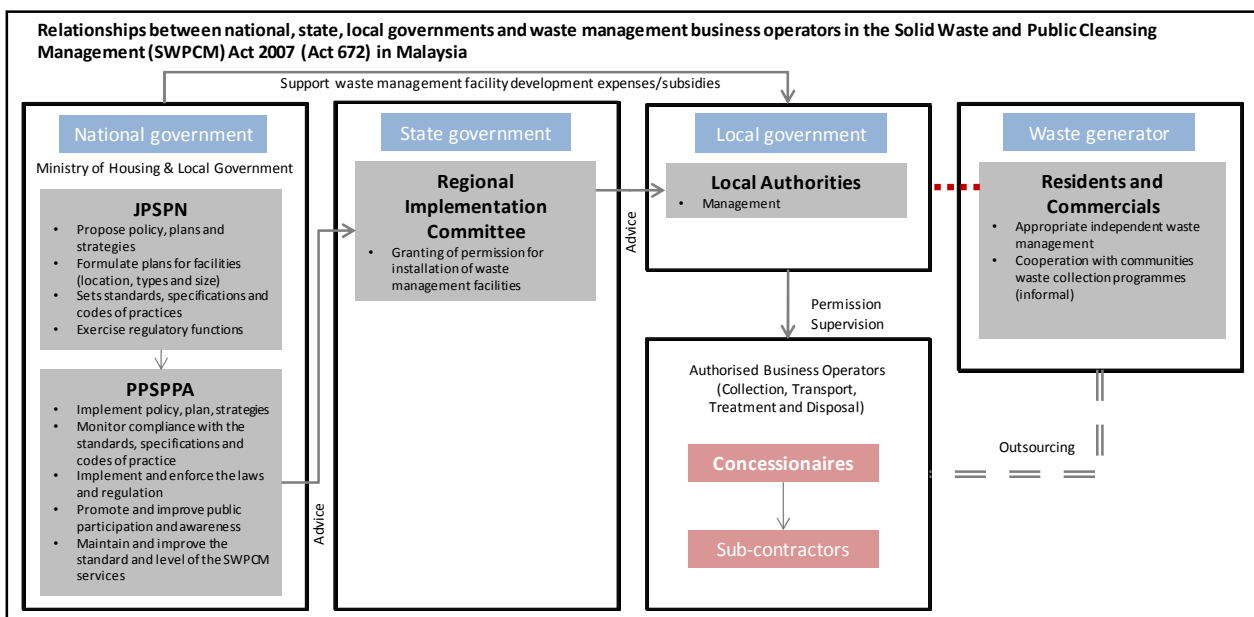
system.

**Divergence from decentralisation in Malaysia**

Lastly, Watanabe and **Mr Mohd Rosli** gave an overview of the main actors and waste management mechanisms in Malaysia (Figures 4 and 5). Up until 2007, responsibility for municipal waste management lay exclusively with the local authorities. However, more stringent requirements for advanced treatment and sparse financial resources of a single local authority called for a more integrated solid waste management structure. A holistic approach to

provide executive authority to the federal government under the purview of the National Solid Waste Management Department (JPSPN) as the regulatory agency and Solid Waste and Public Cleansing Management Corporation (PPSPPA) as the implementing agency. While Malaysia has federalised solid waste management under Act 672 in 2007, this concentration of responsibility at the national level led to exclusion at the local level with a lack of active participation from the population. Representation of local citizens is constrained even though there are currently 53 existing PPSPPA branches in 144<sup>iv</sup> local

**Figure 4: Roles and Responsibilities of Different Entities in Municipal Waste Management**



Source: <http://ensearch.org/wp-content/uploads/2012/07/Paper-13.pdf>, JPSPN, own illustration

**Figure 5: Three Privatised Concessionaires<sup>v</sup>**

|   |   |  |
|---|---|--|
|  |  |  |
| <b>SWM Environment (South)</b><br>Johor<br>Melaka<br>Negeri Sembilan                | <b>E-Idaman (Northern)</b><br>Kedah<br>Perlis                                       | <b>Alam Flora (Central and Eastern)</b><br>Kuala Lumpur<br>Putrajaya<br>Pahang       |

Source: JPSPN

authorities.

In spite of the federalisation attempt, the enforcement of it is not uniform. Four states in the Peninsular have not adopted the Act, namely Perak, Selangor, Penang and Kelantan. At the state level, a Regional Implementation Committee is established to convene monthly with respective bodies<sup>vi</sup> to designate land for new facilities, for example. Meanwhile, local authorities channel funds to the facilities' operators. The government also subsidises local authorities facing inadequate financial resources.

**Towards a zero-waste system**

Undeniably, the spirit of “mottainai”<sup>vii</sup> is less reflected in Malaysians when compared to the Japanese 3R (reduce, reuse, recycle) culture (see Table 2). Technology solutions such as advanced incinerators alone should not be seen as the silver bullet in waste disposal. Green technology such as biogas plants could be a feasible solution due to our high agricultural waste generation as well as high organic waste composition in households (52 percent of all household waste). From Watanabe’s perspective, an incentive mechanism to foster 3R initiatives should be in place for state and local authorities. An effective management of municipal solid waste applies at all levels of society and is highly reliant on active public

participation, awareness and acceptance. A typical instrument, which could promote coordination among the various actors, is public-private partnerships. Every change agent contributes towards a zero-waste system in support of sustainable growth.

**Less is more — lessons learned from Japanese experience**

Given the crucial importance of waste management in ensuring our environmental wellbeing, externalities of all economic, social and environmental costs have to be internalised. The case of Japan has clearly shown that in the provision of waste management facilities, considerations for economic and environmental efficiency are not the most critical factors. Social inclusion in decision making processes is the breakthrough to reformation and transformation. Essentially, a strategic supply chain for the integration of a waste management system has to be embedded. To support these efforts, motivation for waste reduction and recycling as well as inclusive governance throughout the process are vital key drivers. Above all, civil society at all levels — both public and private sectors — must nurture a common vision and shared goals to enable integration.

**Table 2: Comparison Indicators for Municipal Waste Management**

| Indicator                                     | Tokyo, Japan | Malaysia |
|---|--------------|----------|
| Recycling rate (%) in 2012                    | 20.8         | 10.5*    |
| Municipal waste per capita per day (kg/cap/d) | 1.09         | 1.17*    |

\*Source: JPSPN, 2014

<sup>i</sup>Special wards are 23 municipalities that together make up the core and the most populous part of Tokyo, Japan.  
<sup>ii</sup>Extended Producer Responsibility is an environmental protection strategy, which makes the manufacturer of a product responsible for the entire lifecycle of the product as well as for the take back, recycling and final disposal of the product.  
<sup>iii</sup>Thus far, there are 19 incinerators, one landfill and two incinerators under construction with a capacity of 12,000 tonnes a day in all 23 wards of Tokyo as shown in Figure 3. Comparably, Singapore’s centralised system is illustrated through five incinerators with similar capacity of 10,000 tonnes a day.  
<sup>iv</sup>There are 97 local authorities in West Malaysia and 47 in East Malaysia as of 2007.  
<sup>v</sup>They are argued to have a monopoly of waste collection and transportation, with Alam Flora accountable for 40 percent of all waste collection.  
<sup>vi</sup>PPSPPA, state government, local authorities and concessionaires.  
<sup>vii</sup>A term conveying a sense of regret for resources turned into waste without being appreciated to its fullest.