What a Waste 2.0:
A Global Snapshot of Solid Waste Management to 2050

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WORLD BANK GROUP

Tokyo Development Learning Center

JAPAN Gov
THE GOVERNMENT OF JAPAN
• Waste generation is anticipated to increase by 70% by 2050 with Sub-Saharan and South Asia growing the fastest (35% of global waste by 2050)

• One-quarter of global plastic waste is coming from East Asia and the Pacific with ocean waste primarily coming from 5 countries in the region

• Nearly 50% of solid waste operations involve the private sector, nonprofits or civil society and there is further opportunity to engage
Waste is expected to increase by 70% by 2050

2016: 2.01 billion tonnes
2050: 3.40 billion tonnes
Waste generation is positively correlated with urbanization.
Sub-Saharan Africa and South Asia are the fastest growing regions
Per capita waste generation increases with income
High income countries generate 34% of the world’s waste with 16% of the global population.
Composition of waste varies by income
Food loss and waste amounts to 30% globally

Source: FAO
Plastic waste generation is growing rapidly

242 million tonnes =

24 trillion plastic bottles = 4.8 million Olympic-sized swimming pools
Three regions account for 60% of plastic waste generation

- 35 million tonnes, North America
- 45 million tonnes, Europe & Central Asia
- 57 million tonnes, East Asia & Pacific
- 105 million tonnes, Remaining Regions
Low-income countries collect only 39% of waste.
33% of global waste is openly dumped with over 90% in low-income countries.
Solid waste management contributes to **5% of global emissions** (excluding transportation)

**2016**: 1.6 billion tonnes CO$_2$-equivalent GHG emissions

**2050**: 2.6 billion tonnes CO$_2$-equivalent GHG emissions
The poor are most affected by inadequate waste management
30% of countries do not have any institutions or policies to address waste
Waste is overwhelming a predominantly local government responsibility
Local governments often lack funds, only covering ~50% of investment costs for waste systems.

Remainder comes mainly from the national government and the private sector.
>50% of services are operated by public entities & ~1/3 involve a public-private partnership
In low-income countries waste management consumes ~20% of municipal budgets.

High income countries: >$100/tonne
Lower-income countries: ~$35/tonne
Time for action is now.
Major investment is needed

1) Focus on Sub-Saharan Africa and South Asia which account for nearly half of the growth in waste by 2050

2) Prioritize 5 countries in Asia to address bulk of marine litter problem
Engage the private sector

3) Adopt regulations and incentives to attract financing and the right partners—private sector, nonprofits, or civil society
### Table 5.2  Typical Waste Management Costs by Disposal Type

<table>
<thead>
<tr>
<th></th>
<th>Low-income countries</th>
<th>Lower-middle-income countries</th>
<th>Upper-middle-income countries</th>
<th>High-income countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection and transfer</td>
<td>20–50</td>
<td>30–75</td>
<td>50–100</td>
<td>90–200</td>
</tr>
<tr>
<td>Controlled landfill to sanitary landfill</td>
<td>10–20</td>
<td>15–40</td>
<td>20–65</td>
<td>40–100</td>
</tr>
<tr>
<td>Open dumping</td>
<td>2–8</td>
<td>3–10</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Recycling</td>
<td>0–25</td>
<td>5–30</td>
<td>5–50</td>
<td>30–80</td>
</tr>
<tr>
<td>Composting</td>
<td>5–30</td>
<td>10–40</td>
<td>20–75</td>
<td>35–90</td>
</tr>
</tbody>
</table>

*Source:* World Bank Solid Waste Community of Practice and Climate and Clean Air Coalition.

*Note:* — = not available.

### Table 5.4  Waste Management User Fees by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Average user fee in selected cities (US$/year, as reported in data)</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Asia and Pacific</td>
<td>46</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>83</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>80</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>55</td>
</tr>
<tr>
<td>South Asia</td>
<td>34</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>10–40 (based on World Bank estimates)</td>
</tr>
</tbody>
</table>
# Crisp summary of data collection from Japanese cities

<table>
<thead>
<tr>
<th>City</th>
<th>Yokohama</th>
<th>Osaka</th>
<th>Kobe</th>
<th>Kitakyushu</th>
<th>Toyama</th>
<th>Naha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>3,730,345</td>
<td>2,679,962</td>
<td>1,547,494</td>
<td>972,192</td>
<td>418,495</td>
<td>323,558</td>
</tr>
<tr>
<td>Waste disposal per person per day (kg/Jan/p·d)</td>
<td>0.87</td>
<td>1.04</td>
<td>0.99</td>
<td>1.15</td>
<td>1.07</td>
<td>0.85</td>
</tr>
<tr>
<td>Recycling rate</td>
<td>25.53%</td>
<td>9.67%</td>
<td>14.89%</td>
<td>25.38%</td>
<td>24.28%</td>
<td>15.02%</td>
</tr>
</tbody>
</table>

**Source separation**
- Paper & Cardboard, Glass, Plastic & Packaging, PET bottles, etc.
- Paper & Cardboard, Glass, PET bottles, etc.

**Non-source separation**
- Organic
- Organic
- Organic
- Organic
- Organic
- Organic, Plastic & Packaging

**Recycling cost (JPY/t)**
- 13,240
- n.a.
- 33,687
- 30,527
- 16,074
- 26,415

**Incineration cost (JPY/t)**
- 9,359
- 16,285
- 13,982
- 16,074
- 25,228

**Landfill cost (JPY/t)**
- 3,983
- 9,972
- 2,014
- 26,656
Total figure of food waste recycling/treatment in Japan

Note: Figure is a data for FY2014
# Relationship Between National and Municipal Governments on Municipal Waste Management in Japan

<table>
<thead>
<tr>
<th>Local governments</th>
<th>National government</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Survey on the state of MSW management</strong></td>
<td>- Data collection and submission of the waste-related data</td>
</tr>
<tr>
<td></td>
<td>- Collecting data from local governments and summarizing as a database</td>
</tr>
<tr>
<td></td>
<td>- Database</td>
</tr>
<tr>
<td><strong>2. Basic plan on MSW management</strong></td>
<td>- Development of a basic plan on MSW management</td>
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<tr>
<td></td>
<td>- Provision of the guidelines for a basic plan on MSW management</td>
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<tr>
<td></td>
<td>- Guidelines</td>
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<tr>
<td><strong>3. Implementation of the basic plan</strong></td>
<td>- Development of waste treatment facilities</td>
</tr>
<tr>
<td></td>
<td>- Provision of subsidies on a development of waste treatment facilities (1/3 of construction costs and 1/2 if high efficiency WtE facility)</td>
</tr>
<tr>
<td></td>
<td>- Application</td>
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<tr>
<td><strong>4. Mutual understanding of the state of both governments</strong></td>
<td>- Collect and submit opinions of local governments through Japan Waste Management Association and etc.</td>
</tr>
<tr>
<td></td>
<td>- Exchange human resources between national and local governments</td>
</tr>
<tr>
<td></td>
<td>- Subsidies</td>
</tr>
<tr>
<td></td>
<td>- Human resources/information</td>
</tr>
</tbody>
</table>
Thank you

worldbank.org/what-a-waste