Proper separation and collection of business-related food waste in Bandung City

Japan Environmental Sanitation Center
(JESC)
Output 2

Capacity Building for business entities (restaurants, hotels and Traditional markets)

Proper separation and collection of business-related food waste

- Transfer Depot
  - business-related food waste

- Biodigester
  - Recycle of food wastes

Separation & collection
Key activities

Properly separate and collect business-related food waste

Business entities
- Restaurants
- Hotels
- Traditional markets

Organic food waste

Bio-digester
Schedule and Work allocation in 2017

- Evaluation of foregone studies and acquiring **current flow of business-related food wastes**
- Selection of model business entities and investigation on **the amount and the composition** in each model business entity
- Investigation on **actual situations of food waste disposal/recycle** in each selected model business
Schedule and Work allocation in 2018

- Preparation of a waste separation and collection manual on business-related food wastes based on the results

- Implementation of the training for proper separation and collection of commercial organic wastes
Past study survey on business-related food wastes

**Fig. 1 Waste amount in Bandung City in 1994**

<table>
<thead>
<tr>
<th>No</th>
<th>source</th>
<th>Ton</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Residential</td>
<td>983,40</td>
<td>65,56</td>
</tr>
<tr>
<td>2</td>
<td>Traditional Market</td>
<td>281,55</td>
<td>18,77</td>
</tr>
<tr>
<td>3</td>
<td>Road</td>
<td>82,80</td>
<td>5,52</td>
</tr>
<tr>
<td>4</td>
<td>Commercial Area</td>
<td>89,85</td>
<td>5,99</td>
</tr>
<tr>
<td>5</td>
<td>Institution</td>
<td>42,15</td>
<td>2,81</td>
</tr>
<tr>
<td>6</td>
<td>Industry</td>
<td>20,25</td>
<td>1,35</td>
</tr>
<tr>
<td>SUM</td>
<td></td>
<td>1,500,00</td>
<td>100</td>
</tr>
</tbody>
</table>

*) PD. Kebersihan Research at 1994

**Fig. 2 Waste amount in Bandung City in 2005**

<table>
<thead>
<tr>
<th>source</th>
<th>Organik</th>
<th>An organik</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>56 %</td>
<td>44 %</td>
</tr>
<tr>
<td>Non Residential</td>
<td>48 %</td>
<td>52 %</td>
</tr>
<tr>
<td>average</td>
<td>52 %</td>
<td>48 %</td>
</tr>
</tbody>
</table>

*) Evaluation of waste recycling potential in Bandung Municipal Solid Waste Oleh Prof Enry D. dkk, 2005
Interview survey on actual situations of food waste discharge in each selected business entity

Traditional market

Restaurant (Shopping mall)

Hotel
Sampling survey on the amount and the composition of food waste in business entities in Bandung City

1. Type of business entities and number of sample
   (1) 2 traditional markets, 6 samples
   (2) 3 hotels, 3 samples
   (3) 3 middle class restaurants, 3 samples

2. Sampling method and dates of sampling
   SNI 19-3964-1994
   September to November in 2018

3. Results
1. Traditional markets

- Small restaurant 1
- Small restaurant 2
- Vegetable booth 3

Cihaurgeulis Market:
- Vegetation: 90%
- Rice, Noodle: 5%
- Egg skin: 4%
- Bone: 1%
- Plastic: 1%
- Paper: 1%
- Banana leaf: 0%

Sederhana Market:
- Vegetation: 64%
- Rice, Noodle: 18%
- Egg skin: 11%
- Bone: 3%
- Plastic: 2%
- Paper: 1%
- Banana leaf: 1%

Vegetable booth 3:
- Vegetation: 84%
- Rice, Noodle: 8%
- Egg skin: 5%
- Bone: 3%
- Plastic: 2%
- Paper: 1%
- Banana leaf: 0%
2. Hotels

Hotel 1
- Vegetable: 39%
- Rice: 36%
- Banana leaf: 7%
- Bone: 8%
- Egg skin: 1%
- Paper: 2%
- Plastic: 5%

Hotel 2
- Vegetable: 35%
- Rice: 27%
- Banana leaf: 14%
- Bone: 7%
- Egg skin: 1%
- Paper: 3%
- Plastic: 3%

Hotel 3
- Vegetable: 42%
- Rice: 38%
- Banana leaf: 1%
- Bone: 3%
- Egg skin: 3%
- Paper: 8%
- Plastic: 5%
3. Restaurants

- Resto 1:
  - Veg/fruit: 25%
  - Rice: 45%
  - Banana leaf: 9%
  - Bone: 8%
  - Eggs Skin: 10%
  - Paper, Tissue: 1%

- Resto 2:
  - Veg/fruit: 37%
  - Rice: 32%
  - Banana leaf: 12%
  - Bone: 6%
  - Eggs Skin: 1%
  - Paper, Tissue: 1%

- Resto 3:
  - Veg/fruit: 53%
  - Rice: 11%
  - Banana leaf: 8%
  - Bone: 6%
  - Eggs Skin: 5%
  - Paper, Tissue: 3%
  - Plastic: 14%
# Result of amount and density

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Amount (kg/day)</th>
<th>Density (kg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cihourgeulis Market</td>
<td>small restaurant 1</td>
<td>3.59</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td>small restaurant 2</td>
<td>1.04</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>vegetable booth</td>
<td>3.82</td>
<td>0.25</td>
</tr>
<tr>
<td>Sederhana Market</td>
<td>small restaurant 1</td>
<td>2.1</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>small restaurant 2</td>
<td>3.47</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>vegetable booth</td>
<td>3.24</td>
<td>0.23</td>
</tr>
<tr>
<td>Hotel</td>
<td>hotel 1</td>
<td>6.66</td>
<td>0.46</td>
</tr>
<tr>
<td></td>
<td>hotel 2</td>
<td>5.08</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>hotel 3</td>
<td>7.45</td>
<td>0.52</td>
</tr>
<tr>
<td>Middle class restaurant</td>
<td>resto 1</td>
<td>7.36</td>
<td>0.49</td>
</tr>
<tr>
<td></td>
<td>resto 2</td>
<td>6.99</td>
<td>0.47</td>
</tr>
<tr>
<td></td>
<td>resto 3</td>
<td>5.34</td>
<td>0.35</td>
</tr>
</tbody>
</table>
Conclusion of sampling survey

- Measurements were carried out for 8 days, in accordance with Indonesian National Standard (SNI) 19-3964-1994
- Food waste must be separated into vegetable, rice, Banana leaf, bone, eggshell, paper, plastic.
- The density of food waste from traditional market is 0.20-0.27 kg/l.
- The density of food waste from hotel and middle class restaurant is 0.36-0.52 kg/l.
Training in Japan (Site visit)

Bio-digester in Ogawa town

BIOENERGY

Kawasaki Nambu School lunch Center
Training program in November

1. Date: 27, November 2018
2. Venue: Gino Feruci kebon Jati Hotel
3. Participants: Managers of restaurants and hotels and PDK
5. Evaluation
## Manual (Draft)

<table>
<thead>
<tr>
<th>Item</th>
<th>Contents</th>
<th>Use</th>
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</thead>
<tbody>
<tr>
<td><strong>Guideline</strong> for separation and collection of commercial organic waste</td>
<td>Essence for action plan in Bandung City</td>
<td>To be incorporated into <em>master plan</em></td>
</tr>
<tr>
<td><strong>Manual</strong> for separation of organic waste in <strong>hotels</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Manual</strong> for separation of organic waste in <strong>restaurants and commercial sectors</strong></td>
<td>How to <em>separate</em> organic waste</td>
<td><strong>Text</strong> for training program</td>
</tr>
<tr>
<td><strong>Manual</strong> for separation of organic waste in <strong>traditional markets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Manual</strong> for collection and transportation of commercial organic waste</td>
<td>How to <em>collect and transport</em> commercial organic waste</td>
<td></td>
</tr>
</tbody>
</table>

*Text extracted from the image.*
Thank you for your attention!

Terima kasih