Challenges in Developing Mitigation Options: Case of Bogor City

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Background & Objectives

- Bogor’s Green City vision
- Development of mitigation options for Medium-term Development Plan (RPJMD) 2019-2024, supported by Bogor City’s BAPPEDA
- Challenges faced by existing mitigation activities in Bogor City

→ To provide insight into operational constraints in some mitigation activities in Bogor City
Workflow for development of Bogor City’s Mitigation Options

1. Review on Bogor City’s GHG emission profile
2. Consultation with Local Agencies on existing and potential mitigation activities
3. Suggested mitigation program and activities
4. Challenges identified
5. Mitigation options for RPJMD 2019-2024
6. Review on Bogor City’s Development and Strategic Plan (RPJMD & Renstra)

Challenges identified

Mitigation options for RPJMD 2019-2024
More than 95% of GHG emissions in Bogor city come from energy sector.
Increasing trend is prominent in transportation and MSW sub-category.
<table>
<thead>
<tr>
<th>Document</th>
<th>Number of Program/activity</th>
<th>Priority (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPJMD - City</td>
<td>315</td>
<td>10.8</td>
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<tr>
<td></td>
<td></td>
<td>6.8</td>
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<tr>
<td></td>
<td></td>
<td>79.6</td>
</tr>
<tr>
<td>Renstra Bappeda (development &amp; planning)</td>
<td>55</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12.7</td>
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<tr>
<td></td>
<td></td>
<td>85.5</td>
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<tr>
<td>Renstra Dinas Perhubungan (transportation)</td>
<td>89</td>
<td>13.5</td>
</tr>
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<td></td>
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<td>22.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>64</td>
</tr>
<tr>
<td>Renstra Dinas Lingkungan Hidup (environmental)</td>
<td>48</td>
<td>28.6</td>
</tr>
<tr>
<td></td>
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<td>36.7</td>
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<tr>
<td></td>
<td></td>
<td>32.7</td>
</tr>
<tr>
<td>Renstra Dinas Perumkim (housing and settlement)</td>
<td>45</td>
<td>15.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31.1</td>
</tr>
<tr>
<td></td>
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<td>53.3</td>
</tr>
</tbody>
</table>
### Mitigation Activities in Bogor City’s Development Plan 2014-2019

<table>
<thead>
<tr>
<th>No</th>
<th>Program</th>
<th>Activities</th>
<th>Responsible agency</th>
</tr>
</thead>
</table>
| 1  | Policy umbrella for climate change related programs | Implementation of mitigation and adaptation actions  
Monitoring and evaluation of mitigation and adaptation actions  
Environmental pollution and damage control  
Vulnerability analysis to support identification of relevant adaptation options  
Establishment of climate change working group to support implementation of mitigation and adaptation actions | Development Planning Agency  
Environmental Agency  
BPBD  
Development Planning Agency |
| 2  | Energy efficiency | at household level  
at commercial facilities  
at government facilities | Settlement Agency  
Public Works and Housing Agency |
| 3  | Transportation | Conversion to BRT  
Conversion to cleaner fuel  
Parking policies e.g high parking tariff and no street parking policy to encourage people using public instead of private transportation  
Improvement and development of pedestrian and bike lane to encourage shifting from using motorized transportation for short trips | Transportation Agency  
Public Works and Housing Agency |
| 4  | Low emission agriculture | Climate smart agriculture  
Low emission animal husbandry | Agricultural Agency |
| 5  | Improvement of green spaces | Quantity (development of new green spaces)  
Quality (replanting and rehabilitation of existing green spaces with hardwood trees) | Gardening Agency |
| 6  | Waste management | 3R  
Waste Bank  
Composter  
Development of new IPAL facilities to cover more areas without onsite waste-water management facilities | Environmental Agency |
Overview on Issues in Transportation in Bogor

Private vehicles (e.g car, motorcycle) dominate roads in Bogor. Mitigation options in transportation is focused on reducing use of private vehicles.

In 2017, there are more than 3,400 units of Angkot (minibus type of public transportation) serving 30 routes.
Main Program in Transportation sub-sector

BRT
Conversion of 796 small city transport into 252 minibuses

PARKING
On and off street parking management, high tariff for private cars/motorcycles

FUEL
Conversion into biofuel for public transportation

PEDESTRIAN
Expansion of pedestrian area from 0.5 km to 24.8 km
Challenges in Transportation sub-sector

The rise of online transportation service

Walking is not a preferable means of transportation for lots of Bogor citizens

Undisciplined vehicle parking habit

In the development of Natural gas-based Fuel Station, equipment were stolen and some of the equipment (e.g. fuel nozzles) do not fit some vehicle types
As of now most budget in waste management are allocated for transportation fuel and labor. Bogor City’s Municipal Solid Waste Management

<table>
<thead>
<tr>
<th>Treatment (per 2015)</th>
<th>Percentage of Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Galuga SWDS (unmanaged shallow), until 2020</td>
<td>70%</td>
</tr>
<tr>
<td>Open burning</td>
<td>8.68%</td>
</tr>
<tr>
<td>3 R</td>
<td>1%</td>
</tr>
<tr>
<td>Others (unidentified)</td>
<td>20.32%</td>
</tr>
</tbody>
</table>

Dominated by organic waste: 66% are food waste 6.5% paper

As of now most budget in waste management are allocated for transportation fuel and labor.
Mitigation Program in Solid Waste Management

New regional landfill in Nambo, operation starts in 2020. Quota for Bogor City is 500 ton/day

233 Community-based Waste Banks; 1 Waste Bank operated by government officers

26 Recycling Stations
Challenges in Municipal Solid Waste Management

- Only around 4% of MSW being segregated, despite existing solid market to absorb paper and other materials being segregated
- Lack of capacity for segregation in households
- No dedicated station to collect used electronic devices
- Rise of small scale food industry with non-biodegradable packaging
- High cost for transportation to Nambo landfill

In terms of composting, lack of segregation caused metal to contaminate compost, thus not suitable for crops. Composts are only being used for decorative plants
Key Messages

• More research concerning supporting and hindering habit/lifestyle for green development → mitigation activities designed and implemented taking into account these information to increase acceptance and adoption.

Example: development of MRT that accommodate shorter stops, utilization of biodegradable food packaging

• Early education on green lifestyle