Economic Spillover Effect
Quantifying the value of sanitation Improvement

Project 7 – Maynilad Water Services Company, Co-treatment system – Quezon City, Manila

Dumaguete City Septage Management System

An on-going research program by GDS, the Asian Development Bank Institute, and BMGF
The **Intrinsic Values** of Sanitation Improvement

FSM programs desludge septic tanks so that:

- On site systems function better
- Pathogens are reduced from the environment
- Nuisances are reduced
- Groundwater and the environment are less impacted

*For these benefits, people pay a fee that covers CAPX and OPEX of the desludging and treatment equipment, plus a profit if the service is provided by the private sector.*
The Spillover Effect: Ancillary benefits (or determents) from development projects. For city-wide sanitation - may include:

- Property values and tax revenues
- Tourism and economic development
- Health and wellness impacts
- Livelihood and jobs
Economic impacts of improved sanitation

Reference: World Bank 2008
Clean up of the Singapore River

*In less than 50 years, improving sanitation has been transformative – resulting in billions of dollars in economic development.*
Before FSM, economic development was growing at 1% per year. The average growth over the 7 years after the project was 8%.

**Question** – how much of the economic development improvements can be attributed to FSM?
### Economic data from Dumaguete City

<table>
<thead>
<tr>
<th>Type of Business</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>% Annual Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>120,883</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>131,377</td>
<td></td>
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<tr>
<td>Banks and other financial institutions</td>
<td>239</td>
<td>248</td>
<td>244</td>
<td>322</td>
<td>339</td>
<td>361</td>
<td>372</td>
<td>396</td>
<td>8</td>
</tr>
<tr>
<td>Caterers and food establishments</td>
<td>570</td>
<td>632</td>
<td>605</td>
<td>685</td>
<td>640</td>
<td>667</td>
<td>684</td>
<td>740</td>
<td>4</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>150</td>
<td>150</td>
<td>138</td>
<td>152</td>
<td>153</td>
<td>165</td>
<td>157</td>
<td>166</td>
<td>1</td>
</tr>
<tr>
<td>Printing and publications</td>
<td>13</td>
<td>17</td>
<td>16</td>
<td>15</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>Real estate lessors</td>
<td>390</td>
<td>427</td>
<td>450</td>
<td>531</td>
<td>555</td>
<td>603</td>
<td>649</td>
<td>697</td>
<td>10</td>
</tr>
<tr>
<td>Retailers</td>
<td>1,676</td>
<td>2,632</td>
<td>2,500</td>
<td>2,748</td>
<td>2,730</td>
<td>2,858</td>
<td>2,887</td>
<td>3,102</td>
<td>10</td>
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<tr>
<td>Services</td>
<td>1,113</td>
<td>1,128</td>
<td>1,154</td>
<td>1,282</td>
<td>1,290</td>
<td>1,383</td>
<td>1,426</td>
<td>1,519</td>
<td>5</td>
</tr>
<tr>
<td>Wholesale/distribution</td>
<td>164</td>
<td>179</td>
<td>170</td>
<td>197</td>
<td>207</td>
<td>201</td>
<td>201</td>
<td>190</td>
<td>2</td>
</tr>
<tr>
<td>Exempted business entities</td>
<td>49</td>
<td>195</td>
<td>87</td>
<td>196</td>
<td>171</td>
<td>79</td>
<td>114</td>
<td>134</td>
<td>22</td>
</tr>
<tr>
<td>Other impositions/fixed taxes</td>
<td>No data</td>
<td>No data</td>
<td>2,344</td>
<td>2,516</td>
<td>2,430</td>
<td>2,490</td>
<td>2,470</td>
<td>2,578</td>
<td></td>
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<tr>
<td>Total</td>
<td>4,364</td>
<td>5,608</td>
<td>7,708</td>
<td>8,645</td>
<td>8,530</td>
<td>8,821</td>
<td>8,974</td>
<td>9,450</td>
<td>15</td>
</tr>
</tbody>
</table>
Quantifying the economic spillover effect

4 variables are used:

- Economic growth indicators (G)
- Impact variable (I) or the impact that unmanaged FS has on the growth indicators
- Correlation variable (C) or the likelihood that improving FSM will positively impact the growth factors
- Linkage variable (L) that describes how FSM is related to other factors that impact growth.

\[
\text{Spillover Value} = (G_a - G_0) \times I \times C \times L
\]

The spillover effect for their FSM program shows that 1.86% of economic growth per year can be attributed to FSM.

For real estate valuations, that is $465,000 per year for every $25 million value.
True Value of an FSM Program

CAPEX and OPEX

+ Spillover effect costs or benefits

+ Internal effect savings

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Savings from program efficiency

True value of the project
Transfer station model

Liquids and solids to treatment plant

Decanting station model

Solids for further processing

Liquids to sewer

Sewer trunk line to WWTP

*Note: Septage contains between 1.5 – 2.5% solids
<table>
<thead>
<tr>
<th></th>
<th>From building to Da Phuoc</th>
<th>From building to decanting or transfer station</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel time 1 way</td>
<td>1.5 – 2 hours</td>
<td>.75 hours</td>
</tr>
<tr>
<td>Number of trucks</td>
<td>49</td>
<td>27</td>
</tr>
<tr>
<td>Annuual collection cost</td>
<td>37.8 BVND</td>
<td>17.9 BVND</td>
</tr>
<tr>
<td>Costs over 10 years</td>
<td>591 BVND</td>
<td>280 BVND</td>
</tr>
<tr>
<td>Difference</td>
<td>311 BVND</td>
<td></td>
</tr>
</tbody>
</table>

Assumptions:
- 100,000 homes
- 15,000 commercial / institutional
- Average volume of septic tank – 4 m³
- Average capacity of desludging truck 5 m³
How to use this information

Advocacy – for elected officials and decisionmakers

Advocacy – for stakeholders

Serve as examples to other cities considering FSM. Developing a database of cities and their spillover effect values can help new cities model their own spillover effect values.
Thank you!

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