Understanding the septage desludging models: what works and what doesn’t work?

Jakarta and Surakarta Models

Budi Darmawan, Indonesia
INDONESIA

• Big in size, big in population
• Archipelago and contour in geography
• Have national roadmaps and policies
• Progressing in organize, alignment and implementation
• Almost all cities support by private sector, 50 – 80%
• Cities : Advanced phase and starting phase
• Need more integrated effort and activities
• Need more new technology approaches
CONCEPT OF WASTEWATER MANAGEMENT IN INDONESIA

ON-SITE TREATMENT

- Individual Scale
- Communal Scale

TRANSPORTATION

- Desludging and Transportation Vehicle

SEPTAGE TREATMENT

- Septage Treatment Plant

SERVICES

- Black Water Pipe, Grey Water Pipe, Grease Trap, Persil Pipe, Service Pipe, Inspection Chamber

WASTEWATER TREATMENT

- City-wide Scale WWTP (>20,000 people)
- Residential Scale WWTP (50 – 20,000 people)
- Specific Scale WWTP (ex: high-rise buildings)

Source: Minister of Public Works and Housing Regulation No. 04 Year 2017
Achievement and Target 2024 Sanitation Access Per-Province

<table>
<thead>
<tr>
<th>PROVINSI</th>
<th>CAPAIAN 2020</th>
<th>TARGET 2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aceh</td>
<td>77.06%</td>
<td>80%</td>
</tr>
<tr>
<td>Sumatra Utara</td>
<td>81.08%</td>
<td>95%</td>
</tr>
<tr>
<td>Sumatra Barat</td>
<td>68.11%</td>
<td>85%</td>
</tr>
<tr>
<td>Riau</td>
<td>83.99%</td>
<td>90%</td>
</tr>
<tr>
<td>Jambi</td>
<td>77.82%</td>
<td>80%</td>
</tr>
<tr>
<td>Sumatera Selatan</td>
<td>76.94%</td>
<td>90%</td>
</tr>
<tr>
<td>Bengkulu</td>
<td>78.10%</td>
<td>79%</td>
</tr>
<tr>
<td>Lampung</td>
<td>78.81%</td>
<td>90%</td>
</tr>
<tr>
<td>Kep. Bangka Belitung</td>
<td>92.58%</td>
<td>90%</td>
</tr>
<tr>
<td>Kep. Riau</td>
<td>89.19%</td>
<td>90%</td>
</tr>
<tr>
<td>DKI Jakarta</td>
<td>93.04%</td>
<td>100%</td>
</tr>
<tr>
<td>Jawa Barat</td>
<td>71.40%</td>
<td>90%</td>
</tr>
<tr>
<td>Jawa Tengah</td>
<td>83.24%</td>
<td>95%</td>
</tr>
<tr>
<td>D.I. Yogyakarta</td>
<td>96.96%</td>
<td>95%</td>
</tr>
<tr>
<td>Jawa Timur</td>
<td>80.98%</td>
<td>95%</td>
</tr>
<tr>
<td>Banten</td>
<td>80.00%</td>
<td>90%</td>
</tr>
<tr>
<td>Bali</td>
<td>95.01%</td>
<td>90%</td>
</tr>
</tbody>
</table>

Above national mean rate (> 79.53%)
Below national mean rate (< 79.53%)

17 provinces below national mean rate

Sumber: BPS Susenas, 2021 diolah Bappenas dan RPJMN 2020-2024
SEWERAGE PROJECTS IN INDONESIA (UPCOMING PROJECTS)

**Pontianak – New WWTP**
Expected beneficiaries: 135,085 people
Status: FS has been completed. DED document is under preparation

**Jakarta Zone 6 – New WWTP**
Expected beneficiaries: 180,800 people
Status: design and supervision consultant is on bidding stage

**Bekasi – New WWTP**
Expected beneficiaries: 90,050 people
Status: DED Document preparation

**Mataram – New WWTP**
Expected beneficiaries: 80,000 people
Status: DED document preparation

**Bogor – New WWTP**
Expected beneficiaries: 330,000 people
Status: Fundraising for Full FS

**Bandung – WWTP rehabilitation and expansion**
Expected beneficiaries: 3,000,000 people (PE)
Status: FS document has been completed

**Denpasar – WWTP upgrade and expansion**
Expected beneficiaries: 489,354 people
Status: DED Document revision
JAKARTA SEWERAGE DEVELOPMENT PROJECT (Zone 1)

- WWTP Location: Pluit (3.9 Ha)
- WWTP Capacity: 240,000 m³/day
- Coverage: 4,901 Ha
- Total Cost: Rp 8,72 Trillions
- Benefit Recipients: 989,389 People
- WWTP Technology: A2O – MBR
- Coverage Area: Penjaringan, Pademangan (Jakarta Utara), Taman Sari, Tambora (Jakarta Barat), Sawah Besar, Gambir, Tanah Abang dan Menteng (Jakarta Pusat)

### Scope of Works

<table>
<thead>
<tr>
<th>Scope of Works</th>
<th>Cost Estimation</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervision Consultant for the Works Under Jakarta Sewerage Development Project (Zone 1)</td>
<td>Rp. 351.314.687.695</td>
<td>on bidding stage</td>
</tr>
<tr>
<td>Package 1: Construction of WWTP (JICA Loan)</td>
<td>Rp. 4.001.758.631.853</td>
<td>1. Revision of PQ document and bidding document</td>
</tr>
<tr>
<td>Package 2: Construction of Sewers in Area 1-1 (JICA Loan)</td>
<td>Rp. 915.659.258.642</td>
<td>2. Determination of the cost estimation plan is on process of approval from Director General of Human Settlements</td>
</tr>
<tr>
<td>Package 3: Construction of Sewers in Area 1-2 (JICA Loan)</td>
<td>Rp. 1.983.818.324.349</td>
<td></td>
</tr>
<tr>
<td>Package 4: Construction of Sewers in Pilot Area (JICA Loan)</td>
<td>Rp. 118.020.820.405</td>
<td>Tender Process Begin at 202210</td>
</tr>
<tr>
<td>Package 5: Construction of Sewers in Area 2-1 (APBD DKI)</td>
<td>Rp. 1.050.714.126.103</td>
<td>Discussion of draft PQ document and Tender document</td>
</tr>
<tr>
<td>Package 6: Construction of Sewers in Area 2-2 (APBD DKI)</td>
<td>Rp. 740.960.166.651</td>
<td></td>
</tr>
</tbody>
</table>

JAKARTA

• What works
  • Regulation of subsidized improve sanitation launched
  • Survey and data of program targeted respondent
  • Construction of onsite system in every eligible household

• What doesn’t work (yet)
  • Huge budget refocusing due to covid19 pandemic
  • Monitoring before-after
  • Regular desludging as main target
DINAS SUMBER DAYA AIR
PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA
KEPUTUSAN KEPALA DINAS SUMBER DAYA AIR
PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA
NOMOR
TENTANG
PENETAPAN LOKASI REVITALISASI TANGKI SEPTIK UNTUK 441 CALON
PENERIMA SUBSIDI DINAS SUMBER DAYA AIR PROVINSI DKI JAKARTA

Menetapkan: KEPUTUSAN KEPALA DINAS SUMBER DAYA AIR PROVINSI DKI
JAKARTA TENTANG PENETAPAN LOKASI REVITALISASI TANGKI
SEPTIK UNTUK 441 CALON PENERIMA SUBSIDI DINAS SUMBER
DAYA AIR PROVINSI DKI JAKARTA

KESATU: Penetapan lokasi revitalisasi tangki septik untuk 441 calon
penerima subsidi Dinas Sumber Daya Air Provinsi DKI Jakarta
sebagaimana dalam lampiran keputusan ini;
Plan 2021 - 2022
Survey 2021
10,000 HHs

Const. 2021 - 2022
10,000 HHs

Phase 3 – 10,000 locations
Number of enumerators and surveyors increase
Facilities and supporting strengthen
Scheduled stakeholders coordination meetings
Data Establishment

1. Socialization thru all layers in community

2. Interviews, questioners filling thru android application
The budget of Improved Sanitation Program consists of the cost of procurement Individual Septic Tanks with all the completeness so that Ready-to-use.

Individual Septic Tank is a domestic waste containment and treatment for 1 family.

Communal Septic Tank is a domestic waste containment and treatment that serves up to 5 families.
Delivery

1. To deliver several septic tanks, use trucks and in the night time to avoid traffic congestion.

2. To deliver less septic tanks, use pickup and it is more useful on narrow streets.

3. Local authority should witness the delivery activities.

4. By schedule, septic tank will hand-carry by the masons to the construction site.
Preparing septic tank hole in the ground of beneficiary house

Bringing septic tank inside the house or hole location

Incase the septic tank is wider than the front door, the frame need to be adjust a little.

After construction finished, the tile floor fixed back with the new ones
SURAKARTA

• What works
  • Pilot
  • Regulation
  • Private sector
  • IT based operation
  • Upsize of private sector

• What doesn’t work (yet)
  • How to limit increasing number of private sector in one city
<table>
<thead>
<tr>
<th></th>
<th>Karunia</th>
<th>Karya Mulia &amp; Wahyu</th>
<th>Daffa Jaya</th>
<th>Sihamet Sejahtera</th>
<th>Cahaya</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0271 621624</td>
<td>0271 9135050</td>
<td>0271 7928000</td>
<td>0271 717514</td>
<td>0271 9135050</td>
</tr>
<tr>
<td>Owner's name</td>
<td>Sri Tandari</td>
<td>Joko</td>
<td>Dani</td>
<td>Jend Widodo Dina</td>
<td>Ade</td>
</tr>
<tr>
<td>Type</td>
<td>Truck</td>
<td>Truck</td>
<td>Truck</td>
<td>Truck</td>
<td>Truck</td>
</tr>
<tr>
<td>Number</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Capacity</td>
<td>2.5 m³</td>
<td>3 m³</td>
<td>3 m³</td>
<td>2 m³</td>
<td>2.7 m³</td>
</tr>
<tr>
<td>Price when purchased</td>
<td>Rp 70 millions</td>
<td>Rp. 90 millions</td>
<td>Rp. 150 millions</td>
<td>Rp. 80 millions</td>
<td></td>
</tr>
<tr>
<td>Cash/credit</td>
<td>Cash</td>
<td>Cash</td>
<td>Cash</td>
<td>Cash</td>
<td>Cash</td>
</tr>
<tr>
<td>Equip cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of empty</td>
<td>2</td>
<td>2</td>
<td>2 x 2 + 1</td>
<td>2+1</td>
<td>2</td>
</tr>
<tr>
<td>Other businesses</td>
<td></td>
<td>Batik trading</td>
<td>Notary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of trips / month</td>
<td>50 - 70</td>
<td>35</td>
<td>60</td>
<td>20</td>
<td>60</td>
</tr>
<tr>
<td>Working days</td>
<td>30</td>
<td>25</td>
<td>30</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Customers</td>
<td>Household</td>
<td>Household, Hosp, Hotel</td>
<td>Household</td>
<td>Household, Manuf, Hotel</td>
<td>Household, Factory, Hotel</td>
</tr>
<tr>
<td>Areas</td>
<td>Kota Solo</td>
<td>Sukoharjo</td>
<td>Wonogiri</td>
<td>Kartosuro</td>
<td>Wonogiri</td>
</tr>
<tr>
<td></td>
<td>Gemolang</td>
<td>Wonogiri</td>
<td>Purwodadi</td>
<td>Mangu</td>
<td>Salatiga</td>
</tr>
<tr>
<td></td>
<td>Kartosuro</td>
<td>Boyolali</td>
<td>Kartosuro</td>
<td>Boyolali</td>
<td>Boyolali</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sragen, Tw Mangu</td>
</tr>
</tbody>
</table>
Business Performance

From some private sector those operate in the city of Surakarta, comparison between Investment and Income monthly.

Private Sector Business Performance Table
Pilot Activity

Collaboration of 2 (two) Private Sectors

- 20 HOUSEHOLDS TRIAL
- DETAILED ACTUAL COST
- 1 TRIP FOR 2 OR MORE HOUSEHOLDS
- 1 DAY FOR 3 OR MORE TRIPS
- REG-DESLUDGING PAYMENT ARRANGEMENT
- EXTRA JOBS PAYMENT ARRANGEMENT
- MANUAL TO E-MONITORING
- Decree of the Mayor of the Head of District Level II Surakarta Number: 800 / 646 Date : June 10, 1998.

- Regional Regulation of Surakarta Regional Municipality Level II Number : 3 Years 1999 Date : May 27, 1999 on Liquid Waste Management.


- Decree of the Mayor of Surakarta Number: 15 Year 2002 Date : November 29, 2002 About : Determination of Waste Management And Customer Group.


- Decree of the Mayor of Surakarta No. 5 of 2004 concerning Amendments to : Decree of the Mayor of Surakarta Number 15 of 2002 concerning Tariff Determination Waste Management and Customer Group.

-Regulation of the mayor of Surakarta number 16 A Year 2014 on Management Stool Mud, August 13, 2014.
Start from PS office

Arrive at location HH to be desludge

Working and finished

Dumping at IPLT

Data process at UPT office

Start from PS office

Payment to Private Sector

Back to Private Sector office
Finding the address

Introduction self and the program

Q n A, and check the existing septic tank location

Agree on the desludging schedule. Signed
The Difficult Case

1. After finding the address, introduction the program
2. Checking the black water pipe
3. The septic tank buried under 40cm thick concrete
The Impossible

1. Finding the address
2. Checking the septic tank location
3. End of discussion
1. At the date and time agreed, desludger comes to the house and prepare

2. Put the QR Code sticker on the window and scanned before start the work

3. Desludging

4. After finishing work, the desludger performs another scan as a mark that he has finished working
Paper work of desludging activity

*Customer list

*Work Order from authority

*Agreed customer schedules

*Customer QR Code stickers
1. Arrive at the treatment facility
2. Dumping the sludge
3. Scan the truck’s QR Code as a mark of finishing the job

Closing the loop
How to manage manual database to digital

1. Existing customer data
2. Organize by excel database
3. Development of assigned customer database on android application
4. Generate QR Code stickers
Life transformation 2012 - 2021

1. Graduate from Chemical High School
2. 1st Desludging Truck
3. ID Card of registered Private Sector Desluder
4. 3 trucks and 5 crews
Terima kasih
Thank you