Current Status of the Planning of Municipal Wastewater Treatment System in Myanmar

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Outline

- Background
- Sanitation Coverage
- Current status of Yangon and Naypyitaw City
- Guideline for Wastewater Effluent Quality
- Challenges
- Concluding remarks
Background Information
Situated in - South East Asia
Area - 261,228 square miles - 677,000 sq km
Climate - Tropical monsoon - (3 seasons)
Annual Rainfall - 2500 mm (Delta Region)
- 1000mm (Dry Zone)
- 5000mm (Coastal Region)
Average Temperature - 22~40 degrees Celcius
Population - 51.4 millions
Density - 80 per sq km
Administrative - 14 states/regions

Sanitation Coverage In Myanmar

- Improved Sanitation Facility in urban area: 94.5%
- Improved Sanitation Facility in rural area: 19.6%
- Unimproved Sanitation Facility in urban area: 5.5%
- Unimproved Sanitation Facility in rural area: 80.4%

[Source- Multiple Indicator Cluster Survey (DOH) (2009-2010)]
# Related Organizations to Municipal Wastewater Treatment

(Various agencies and department engaged in wastewater sector)

<table>
<thead>
<tr>
<th>Agency/Department</th>
<th>Ministry/City/Others</th>
<th>Type of Sanitation Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yangon City Development Committee</td>
<td>Yangon</td>
<td>Sewerage, septic system, Pit latrine with slab, Activated sludge wastewater treatment plant</td>
</tr>
<tr>
<td>Naypyitaw City Development Committee</td>
<td>Naypyitaw</td>
<td>Sewerage, septic system, Pit latrine with slab, Activated sludge wastewater treatment plant</td>
</tr>
<tr>
<td>Mandalay City Development Committee</td>
<td>Mandalay</td>
<td>Septic tank system, Pit latrine with slab</td>
</tr>
<tr>
<td>Water and Sanitation Division Building</td>
<td>Construction</td>
<td>Septic tank system</td>
</tr>
<tr>
<td>Department of Development Affairs</td>
<td>Border Affairs</td>
<td>Septic tank system, Pit latrine with slab</td>
</tr>
<tr>
<td>Environmental Sanitation Division</td>
<td>Health and Sports</td>
<td>Systematic latrine Construction</td>
</tr>
</tbody>
</table>

## SEWAGE SYSTEM OF YANGON
Status of Sewage Treatment in Yangon City

<table>
<thead>
<tr>
<th>Treatment facility</th>
<th>Percentage of population (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional Sewerage System</td>
<td>7.3%</td>
</tr>
<tr>
<td>Septic Tank System</td>
<td>18.4%</td>
</tr>
<tr>
<td>Pour Flush System</td>
<td>28.0%</td>
</tr>
<tr>
<td>Fly Proof Latrines</td>
<td>18.0%</td>
</tr>
<tr>
<td>Unsanitary Latrine</td>
<td>28.0%</td>
</tr>
<tr>
<td>No Latrine</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

Source – YCDC

Situation of Sewerage and Wastewater Treatment Plant in Yangon
Sewerage System

- Wastewater treatment plant
- Air compressor station
- Total length of sewer pipe line: (10.75) km (12" CI to 36" CI Pipe)
- Sewage ejectors: (35) Nos

Disposal of Sewage into the river without any treatment before proposed Sewage Treatment Plant
Activated Sludge Wastewater Treatment Plant

Year of Establishment - 12th April 2003
Year of Completion - 17th January 2005
Volume of Daily Treatable sewage - 3.25 MGD
Developer - Myanmar Engineers of Yangon City Development Committee
Cost of Project - USD 0.96 Millions
Areas of Plant - 5.56 Acres

Design Criteria:
Design population - 300,000
Daily wastewater discharge - 14775 m3/day
BOD influent - 600mg / l
BOD effluent - 20-40 mg / l
Suspended solid influent - 700 mg / l
Suspended solid effluent - 40 mg / l

Long Term Plan for Yangon City
SEWAGE SYSTEM OF NAYPYITAW

EXISTING SEWERAGE SYSTEM IN NAY PYI TAW

• 20% of new constructed area of Nay Pyi Taw using sewage treatment plant (Aerobic System)

• 80% using Septic Tank (Anaerobic System) and Pit Latrine with slab

• Sewage collection is combined system

• Sewer pipes are directly connected with waste water treatment plant
Using Sewage System w.r.t Quarter

<table>
<thead>
<tr>
<th>Sr</th>
<th>Quarter</th>
<th>Population</th>
<th>Sewage System</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mingal Thaikdi</td>
<td>5972</td>
<td>Central System</td>
</tr>
<tr>
<td>2</td>
<td>Bawaga Thaikdi</td>
<td>5252</td>
<td>Separate System</td>
</tr>
<tr>
<td>3</td>
<td>Pyinnyar Thaikdi</td>
<td>8239</td>
<td>Separate System</td>
</tr>
<tr>
<td>4</td>
<td>Zayya Thaikdi</td>
<td>3700</td>
<td>Separate System</td>
</tr>
<tr>
<td>5</td>
<td>Dana Thaikdi</td>
<td>7994</td>
<td>Separate System</td>
</tr>
<tr>
<td>6</td>
<td>Bala Thaikdi</td>
<td>7632</td>
<td>Separate System</td>
</tr>
<tr>
<td>7</td>
<td>Nyarna Thaikdi</td>
<td>8537</td>
<td>Separate System</td>
</tr>
<tr>
<td>8</td>
<td>Thuka Thaikdi</td>
<td>5548</td>
<td>Separate System</td>
</tr>
<tr>
<td>9</td>
<td>Wanna Thaikdi</td>
<td>8915</td>
<td>Separate System</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>61789</td>
<td></td>
</tr>
</tbody>
</table>

Source – NCDC

Influent Quality
- Biochemical Oxygen Demand (BOD,20°C): 250mg/lit
- Suspended Solids (SS): 220mg/lit
- Total Organic Carbon (TOC): 160mg/lit
- Chemical Oxygen Demand (COD): 500mg/lit

Effluent Quality
- Biochemical Oxygen Demand (BOD,20°C): 20mg/lit
- Suspended Solids (SS): 30mg/lit
- Chemical Oxygen Demand (COD): 60mg/lit
SEWAGE TREATMENT PLANT IN NAYPYITAW

Grit Chamber (Inlet of Sewage Treatment Plant)

Aeration Tank of Sewage Treatment Plant

Equalization Tank for Sewage Collection

Aeration Tank

Treated Water Collection or Retention Pond
### Decentralized Wastewater Treatment System in Myanmar

#### Septic Tank and Soak Pit

![Image of a Septic Tank System](http://www.slideshare.net/dsbigornia/johkasou/)

### Comparison of Septic Tank System

<table>
<thead>
<tr>
<th></th>
<th>Conventional Septic Tank</th>
<th>Jokasou</th>
<th>Sewage Treatment Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>For</strong></td>
<td>Black Water</td>
<td>Black &amp; Gray Water</td>
<td></td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td>Anaerobic + (Under Seepage)</td>
<td>Anaerobic + Aerobic</td>
<td></td>
</tr>
<tr>
<td><strong>Treated water (BOD)</strong></td>
<td>100-150 mg/l</td>
<td>&lt;20 mg/l</td>
<td>20-50 mg/l</td>
</tr>
<tr>
<td><strong>Construction Period</strong></td>
<td>Short</td>
<td>Short</td>
<td>Middle</td>
</tr>
<tr>
<td><strong>Electricity</strong></td>
<td>No Need</td>
<td>Need</td>
<td></td>
</tr>
<tr>
<td><strong>Administrator</strong></td>
<td>Homeowner (Individuality)</td>
<td>Individual or Municipality</td>
<td>Municipality</td>
</tr>
<tr>
<td><strong>Suitable area</strong></td>
<td>Area of scattered population</td>
<td>Area of scattered population</td>
<td>Urban area</td>
</tr>
</tbody>
</table>

Source: [http://www.slideshare.net/dsbigornia/johkasou-](http://www.slideshare.net/dsbigornia/johkasou-)}
1. To provide bearing capacity of soil at site of construction, where required, for the design and construction of reservoirs, water treatment plant and waste water treatment plant. (M)

2. To provide information on the type of soil at site of construction, preferably with respect to the AASHO soil classification. (R)

3. To provide result of Percolation Test where required. (R)

Sanitation (CQHP Guideline)

Sanitation
1. Spent Water (R)
   1-1 Spent water contribution should be based on water demand as given in para. 1-1, Guideline IV. It is recommended that at least 90% of the water consumed will be discharged as spent water.
   1-1-1 Spent water consists of soil and waste water. Table 1, Appendix (R)
      1-1-1-1 Soil water is the spent water from WCs and urinals.
      1-1-1-2 Waste water is the spent water from basins, kitchen sink, and bath rooms.
2. **Soil Water Treatment and Disposal (M)**

2-1 Soil water shall be treated before being discharged into a water course or public drain.

2-2 The effluent quality of the treated soil water shall conform to the following:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD</td>
<td>50 mg/l (maximum)</td>
</tr>
<tr>
<td>COD</td>
<td>100 mg/l (maximum)</td>
</tr>
<tr>
<td>SS</td>
<td>50 mg/l (maximum)</td>
</tr>
</tbody>
</table>

2-3 Soil water discharged into YCDC sewer shall be treated to the following effluent quality:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD</td>
<td>150 mg/l (maximum)</td>
</tr>
<tr>
<td>COD</td>
<td>200 mg/l (maximum)</td>
</tr>
<tr>
<td>SS</td>
<td>150 mg/l (maximum)</td>
</tr>
</tbody>
</table>

*Note: BOD value refers to 5-day incubation period at 20° C.*

2-4 A permit shall be obtained from Pollution Control and Cleansing Department, YCDC, for the discharge of treated soil water.

2-5 Effluent of treated soil water shall be disinfected with chlorine or by any other approved method where required.

2-6 Where effluent is chlorinated, the residual chlorine shall be between 0.0 and 0.1 mg/l.

3. **Waste Water Disposal**

3-1 Waste water from residences may be discharged directly into public drain. (R)

3-2 However, waste water from kitchen sinks of restaurant shall first be discharged into a grease trap before its disposal into public drain. (M)

3-3 Waste water is prohibited from being discharged into YCDC sewer. (M)

3-4 A permit shall be obtained from Pollution Control and Cleansing Department, YCDC, before waste water is disposed of into public drain. (M)
Challenges

- Sanitation activity is not yet priority
- Weakness in water and sanitation sector are limited manpower and technical supporting
- Budget limitation
- Difficulty in the change of awareness to practice among communities
- Less Sustainability due to low cost technology

Concluding Remarks

- Myanmar has reasonable coverage for sanitation
- Capacity development for key players such as water professions from different agencies, users, local authorities stakeholder, is prerequisite, so that all stakeholders need to encourage integrated approach, help in addressing other sector problems
- To set up the Subsidy system for homeowner leading to appropriate wastewater treatment system
- So, law enforcement is also essential for implement more comprehensive formation of municipal wastewater treatment and could be more effective and useful for the country
THANK YOU

FOR YOUR TIME & INTEREST