SDG6: Ensure Availability and Sustainable Management of Water & Sanitation for All

By

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What Korea has done and learned
Current Status of Korean Sewerage Works

**Sewage Works**
- 1st Sewage Treatment Plant (STP) in Korea (1976)
- Currently 597 STPs in Korea (2014)
- STP Effluent Standards = 6 items
- National Service Rate = 92.5%
- From Conventional Process to Tertiary Process
- O&M by Municipal Gov’t (35%) vs Private Sector (65%)
<table>
<thead>
<tr>
<th>Year</th>
<th>Law</th>
<th>BOD (mg/L)</th>
<th>SS (mg/L)</th>
<th>TN (mg/L)</th>
<th>TP (mg/L)</th>
<th>Coliforms (EA/mL)</th>
<th>Ecotoxicity (Tu)</th>
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</thead>
<tbody>
<tr>
<td>1978</td>
<td>Env. Protection Law</td>
<td>30</td>
<td>70</td>
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<td>1994</td>
<td>Water Quality Control Law</td>
<td>20</td>
<td>20</td>
<td>120</td>
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<td>2001</td>
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<td>2008</td>
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<td>10</td>
<td>20</td>
<td>2</td>
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<td>-</td>
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<tr>
<td>2012</td>
<td>Sewerage Law</td>
<td>5</td>
<td>10</td>
<td>20</td>
<td>0.2</td>
<td>1,000</td>
<td>-</td>
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</tbody>
</table>
Advancement of Sewage Treatment

- Water Reclamation from Wastewater
- Prevention of Eutrophication
- Protection of Water Quality
- Removal of BOD & SS
- Removal of N & P
- Management of Toxic materials
Q1. What are the most effective ways that STI could support the achievement of the SDGs?

A. Thru “Back to Basic” approach of knowledge sharing and technology transfer, develop its own capability to achieve the SDG 6 target

1) Develop the National Technology Road Map (NTRM) for Water and Sanitation

   Objective – Goals – Strategy – Action / Implementation Plan – Measure based on SMART (Specific, Measurable, Attainable, Realistic, Timely)
Figure 1: Technology Tree for Water Pollution and Liquid Waste Management

Water Pollution and Liquid Waste Management

Monitoring and assessment
- Onsite measurement
- Onsite sampling for laboratory analysis
- Flow measurement

Prevention
- Water efficiency and conservation
- Process optimization
- Advanced membrane technologies

End-of-pipe
- More-mechanized conventional wastewater treatment with conventional sludge treatment
- Less-mechanized (natural) conventional wastewater treatment
- Waste-to-energy treatment
- Advanced (UF, RO)

Rehabilitation
- Bio-remediation
<table>
<thead>
<tr>
<th>Technology Areas</th>
<th>Key technologies</th>
<th>Final target By 2025</th>
<th>Element technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Short Term (2years)</td>
</tr>
<tr>
<td>Monitoring and assessment</td>
<td>Onsite sampling technologies for laboratory analysis</td>
<td>Target: monitoring coverage to 50% from the current value (assumptions: 15%)</td>
<td>20%</td>
</tr>
<tr>
<td>Preventive</td>
<td>Water efficiency and conservation technologies</td>
<td>Target: Increasing water efficiency and conservation practices to 60% (baseline: 15%)</td>
<td>25%</td>
</tr>
<tr>
<td>End-of-pipe treatment</td>
<td>More mechanized conventional treatment technologies (ETP)</td>
<td>Target: Decreasing the pollutant load in effluents released to the environment by 50% (baseline: 10%)</td>
<td>20%</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>Bio-remediation technologies</td>
<td>Target: Decreasing the pollutant load of natural water bodies by 25% from baseline value</td>
<td>10%</td>
</tr>
</tbody>
</table>
Q1. What are the most effective ways that STI could support the achievement of the SDGs?

A. Thru “Back to Basic” approach of knowledge sharing and technology transfer, develop its own capability to achieve the SDG 6 target

2) Develop its “Total Solution” Capacity for the Entire Value Chain of Water & Sanitation

Policy – Plan – Program – Project (4Ps)

EPC O&M
(Engineering – Procurement – Construction - Operation – Maintenance)
Issues & Challenges:

1. Growing Demand of Water & Sanitation Infrastructure
2. Shortage of Water Officers & Specialists
3. Inadequate Financial Resources to achieve SDG 6
4. Alternative and Affordable Technologies to SDG 6
5. Lack of Enforcement
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Opportunities for Improvement:

In most countries,
1. Presence of National Policy for Water & Sanitation
2. Presence of National Guidelines for Water & Sanitation
3. Presence of National Laws & Regulations for Water & Sanitation
4. Need of Mainstreaming the SDG 6 into National Policies (Institutional & Legal framework, Policies & Plan)
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Select & Focus on STI for Water and Sanitation:

1. Water Efficiency (Urban, Industrial, Agricultural)
2. Energy Efficiency in Water & Sanitation (W-E Nexus)
3. Resource Recovery from Wastewater
4. Smart Water Management (IOT, Big Data, AI, Cloud)
5. Membrane Technology for Water & Sanitation
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Demonstrate and Deploy “Smart Water Management Initiative” (SWMI)
New Paradigm Wastewater Treatment

Domestic WW
BOD, COD, Trace Metals, N, P

Screen

Primary Settling tank

Anaerobic Digestion

Sludge
(COD, BOD removal)

Solid Fuel

COD, BOD, N, P Recovery

Aeration tank

Biogas
(CH₄, CO₂)

Purification

CO₂

NH₃

Ammonia bicarbonate

Metal Recovery
(As, Cd, Ca, Cr, Co, Cu, Pb, Mg, Ni, Se, Na, Zn)

Fertilizer Reactor

Fertilizer
Reactor

COD, BOD, N, P Recovery

Final Settling tank

Air

BOD, COD, N, P

Final Settling tank

N, P (struvite)

Ammonia Stripping

NH₃

New Paradigm Wastewater Treatment

Agriculture, Aquifer Recharge

Industrial

UV

Heat
Thank you

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