East Asia Urban Sanitation Review

Presentation prepared by Bank Team

September 2013
Outline

Sector Overview

Issues

Recommendations
1. Sector Overview
- Raise public awareness on links between sanitation and:
  - reduction of health risks
  - improved environment

- Engage high level political support as the sanitation issues are complex

- Be a catalyst for change
The study includes Review of:

- Indonesia,
- Philippines, and
- Vietnam

Best international practices - Korea, Malaysia, LAC, EU
Evidence Suggests for action now

World-wide 2.6 billion people lack adequate sanitation, of which 630 million live in East Asia (WHO)

Economic costs of poor sanitation and hygiene amounted to over US$9.2 billion a year (2005 prices) in Cambodia, Indonesia, Lao PDR, the Philippines, and Vietnam (WSP)

Globally, diarrhea is the leading cause of illness and death

88 per cent of diarrheal deaths are due to a lack of access to sanitation facilities, together with inadequate availability of water for hygiene and unsafe drinking water (JMP)

Improved Sanitation Reduces Diarrhea Death rates by a third

Hygiene education can reduce Diarrhea cases by 45% (WHO)
Sanitation Investment Returns are High!

Benefit-Cost ratios of sanitation interventions

In East Asia, $1 spent on Sanitation provides a return of $8 (WHO)

The Annual cost of the Inadequate Sanitation is Large (WSP)

**VIETNAM**
Cost US$780 million (1.3% of GDP)

**PHILIPPINES**
Cost: US$1.4 billion (1.5% of GDP)

**INDONESIA**
US$6.3 billion (2.3% of GDP)
Effluent from septic tanks often discharge to drains or network systems that leak because they are not properly designed or constructed. They overflow in times of heavy rains.

As a result: the household immediate environment in many EA cities is polluted with fecal matter creating serious health risks.

Most homes rely on septic tanks that are not well maintained.
Large Service Gaps

- Household water consumption relatively high with prevalence of flush toilets
- Access to Improved Sanitation Facilities (JMP) high but low levels of wastewater and septage treatment

![Graph showing % coverage of urban population with septage treated and wastewater treated in select countries.](image-url)
2. Issues
Vietnam: Key Findings

**PEOPLE**
- Low willingness to charge is a significant constraint

**TECHNOLOGY**
- Septic tank management not well regulated
- Low cost technologies should be selected
- Most septic tanks connected to drains; but the quality of drains have to improve

**GOVERNANCE**
- Policy to increase sanitation coverage exists; this policy now has to be implemented effectively

**FINANCE**
- Investment costs are covered through explicit policy on central government financing
- Operating costs not covered although there are two different regulations to collect fees from users

Considerable financial commitment but there are implementation issues
WW and Septage Flow in Urban Vietnam

- **Direct Sewerage (no Septic Tank)**: 5%
- **Septic Tanks with Sewerage**: 55%
- **Septic Tanks NO Sewerage**: 22%
- **Other On site**: 18%

Total wastewater treated: 10%
Septage safely disposed / treated: 4%
Septage + wastewater unsafely disposed

**URBAN Population**: 25 million

EAP URBAN SANITATION REVIEW
Ho Chi Minh City – Environmental Sanitation Project: A Successful Model

- 1.2 million people benefitted from improved sanitation

Before…

After…

APPROACH TAKEN

- Resettled informal housing
- Sewers intercepted flow of raw sewage to the canal
- Combined sewers upgraded to collect wastewater and reduce flood risks
- Wastewater pumped for downstream discharge
- New wastewater treatment plant being planned

Benefit: Property value increased twice compared to other areas
Philippines: Key Findings

**People**
- A lawsuit by the concern of residents of Manila Bay led to the Supreme Court Decision to clean up Manila Bay. This is a key Driver for Change.

**Technology**
- Land is a key constraint in developing Technical Solutions in Metro Manila.
- Construction and operation of Septic Tanks not adequate.

**Governance**
- Fragmented sector responsibilities – many agencies responsible for the sector.
- National Sewerage and Septage Plan in place is a promising start.

**Finance**
- Policy to provide 40% grant from central government in place for sewerage investments.
- No financing plan for the entire sector.
- In Metro Manila, water subsidizes the sanitation business.

Implementation in Metro Manila moving forward, strategy needed for the rest of the country.
WW and Septage Flow in Urban Philippines

- **Direct Sewerage (no Septic Tank)** ~3%
- **Septic Tanks with Sewerage** ~1%
- **Septic Tanks NO Sewerage** 84%
- **Other On site** 9%
- **Open Defecation** 3%

**Total wastewater treated** ~4%

- **Wastewater safely collected**
  - **Septage safely collected** 30%
  - **Septage safely disposed/treated** 10%
  - **Septage+ wastewater unsafely disposed**
Two private concessionaires – Manila Water and Maynilad – are working with public sector to make improvements

Plan in place to serve 100% of the population. Cost: 3.4 billion for about 15 mln. people

Phased approach in place:
- Manage Fecal Sludge
- Collect wastewater before discharge to Manila Bay
- Treat collected wastewater
METRO MANILA: A leading example in Asia

Steady progress in septage removal
Indonesia: Key Findings

**PEOPLE**
- Despite low connections, evidence exist that people are willing to pay at least some of the costs of improved sanitation if they can see clear benefits

**TECHNOLOGY**
- Piped water connection is low; water and sanitation needs to be addressed at the same time
- Sustainability issues of DEWATS have to be addressed

**GOVERNANCE**
- National program (PPSP) in place but that will expire in 2014
- Effluent standards less strict compared to other countries in the region (BOD = 100 mg/l)

**FINANCE**
- Financing for DEWATS has increased over time however sector gaps are large
- Billing collection rates are low because access to water is also low

Plans are being put in place to step-up sanitation
WW and Septage Flow in Urban Indonesia

Total wastewater treated 1%

Septage safely disposed/treated 4%

Septage + wastewater unsafely disposed

Open Defecation 14%

Other On site 23%

Septic Tanks NO Sewerage 62%

Communal Toilets ~0%

Septic Tanks with Sewerage ~0.5%

Direct Sewerage (no Septic Tank) <1%

URBAN Population 123 million
3. Recommendations
## Complex Operating Environment

<table>
<thead>
<tr>
<th>Central Gov</th>
<th>Local Gov</th>
<th>Service Provider</th>
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</thead>
<tbody>
<tr>
<td>Policies</td>
<td>Implementation</td>
<td>Provision of water and wastewater services</td>
</tr>
<tr>
<td>Strategy</td>
<td>Targets</td>
<td>Operation, Maintenance</td>
</tr>
<tr>
<td>Laws</td>
<td>Project Development</td>
<td>Billing</td>
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<tr>
<td>Finance</td>
<td>Regulation</td>
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<td>Supervision</td>
<td>Finance</td>
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<tr>
<td>Monitoring</td>
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Quality Service For People
GOAL: CLEAN & HEALTHY CITIES

INTERVENTIONS: Better sanitation for all, with assistance to the poor

- Improved septage management
- Improved wastewater management

HOW

- Promote behavior change through information and education
- Develop and implement city-wide strategies
- Develop expenditure frameworks for investments; and support sustainable services through tariffs
- Carry out utility reforms to focus on service delivery
GOAL: CLEAN & HEALTHY CITIES

People-Centered Policies
- Integrate sanitation with city development plans
- Promote Information, Education, Communication

Cost-Effective Technologies
- Prioritize collection and treatment of septage
- Collect and treat wastewater at least cost
- Adopt climate smart strategies

Sustainable Sanitation Services

Maximize Use of consumer fees to meet operating costs
- Secure capital needs through Sanitation Expenditure Framework
- Strengthen the service provider
- Develop city-wide sanitation strategies

Viable Financial Schemes

People-Centered Policies

1. Sanitation should be integrated with city development plans.

2. A well-informed public is the strongest long-term guarantee of high standards for environmental and urban sanitation issues.

Guided by national policy, each city needs to set objectives that place urban sanitation at the core of a wider strategy for developing a modern city environment and sustaining a healthy and decent quality of life for its population.

The demand for services from well-informed citizens is the basis for increasing levels of both the willingness to charge and the willingness to pay for sanitation services.
Key Institutional Issues and recommendations

1. Every city should have a city sanitation plan that is comprehensive and realistic

   Advanced planning required to take into account current and future population density, zoning, flood risk, topography, and drainage systems

2. Strengthen the service provider

   Put urban sanitation services on a commercial footing. Robust regulatory environment + institutional strengthening to provide the incentives and means for service providers to enhance their performance
Effective Urban Water and Wastewater Utility

- Staff Technical Capacity
- Commercialization of Services
- Efficient provision of Integrated Urban Water Services
- Customer Focus
- Public Awareness / Effective IEC

- Water Supply
- Sewerage
- Septage Management
- Drainage
The collection and treatment of septage should be prioritized.

Wastewater should be collected through maximization of sewerage network and house connections.

Minimize the number of wastewater treatment plants in a catchment area.

Climate-smart sanitation strategies should be adopted.

Increase connectivity and collection of septage by:
1) Enforced regulation
2) IEC
3) Financial Assistance to the poor

Economies of scale created, as the per capita investment cost or operating cost on a cubic meter basis drops for larger plants.

Climate change uncertainties need to be internalized in feasibility studies. Opportunities to convert waste to energy and reuse of wastewater.
Overall Technical Approach

**Type 1:** Septic Tanks with no sewers
- Improve construction and operations
- Ultimately connect to combined or separate sewers, when economically justified

**Type 2:** Septic Tanks with combined sewers
- Improve construction and operation
- Intercept wastewater, improve construction
- Cost effective Treatment

**Type 3:** Septic Tanks with separated sewers
- By pass ST
- Separated sewers
- Cost effective Treatment
Achieving Economies of Scale

Minimize number of treatment plants in a catchment area

FACTORS TO CONSIDER:

- Land: Availability and Cost
- Capital Expenditure
- Operating Expenditure
- Cost of sewerage network
Unit investment costs of larger plants are lower.
Unit operating costs of larger plants are lower.

Operation & Maintenance cost of WWTPs worldwide
(2013 price level)

- Austria - CAS - benchmark
- Romania - CAS - avg
- Tunisia - CAS - avg
- Brazil - UASB+TF - avg

Unit operating costs of larger plants are lower.
INNOVATIONS TO RESPOND TO CHALLENGES

<table>
<thead>
<tr>
<th>Increased Floods Due to Climate Change</th>
<th>Reducing Energy Use and Carbon Emissions in Treatment Plants</th>
<th>Reduce Overall Consumption of Water</th>
<th>Disposal of Sludge Safely</th>
</tr>
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<tbody>
<tr>
<td>- Urban Master Plans and Feasibility Studies should incorporate aspects of flood control</td>
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<tr>
<td>- Generate electricity through anaerobic digesters and reduce carbon emissions</td>
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<tr>
<td>- Plan for water reuse</td>
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<tr>
<td>- Biosolids used for fuel, fertilizer or disposed safely in a landfill</td>
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Resilient, Efficient, and Sustainable Sanitation Systems
Key Financial Issues and recommendations

1. Cost to address sanitation is high and capital needs should be secured through a Sanitation Expenditure Framework.

   Define priorities, mechanisms for the flow of funds, and arrangements for financial management.

2. Consumer fees should be used to meet operating costs.

   Controlling for affordability for the poor. Block tariffs can work where there are piped water systems. Other methods of support to the poor, such as direct transfers, should be provided.
## High Investment Costs for Treatment

<table>
<thead>
<tr>
<th></th>
<th>Vietnam</th>
<th>Indonesia</th>
<th>Philippines</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current urban population (million)</strong></td>
<td>23</td>
<td>110</td>
<td>61</td>
</tr>
<tr>
<td><strong>Urban population in 2025 (million)</strong></td>
<td>36</td>
<td>172</td>
<td>95</td>
</tr>
<tr>
<td><strong>Current wastewater volume (in 1000 m3/day)</strong></td>
<td>3,424</td>
<td>16,538</td>
<td>9,108</td>
</tr>
<tr>
<td><strong>Current treatment of wastewater (percentage)</strong></td>
<td>10</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td><strong>Investment needed to collect and treat wastewater (US$ billion)</strong></td>
<td>8.3</td>
<td>42.7</td>
<td>23.1</td>
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* (US$ 250/capita)
Capital Expenditures not in line with needs

![Bar graph showing capital expenditures in USD for Indonesia, Philippines, and Vietnam. The graph compares current annual investment with annual investment needs.]

- **Indonesia**: Current Annual Investment significantly lower than Annual Investment Needs.
- **Philippines**: Current Annual Investment close to Annual Investment Needs.
- **Vietnam**: Current Annual Investment lower than Annual Investment Needs.
## FACTORS THAT POSITIVELY INFLUENCE CHANGE

### The strongest factors emerging from the country studies that positively influence change

<table>
<thead>
<tr>
<th>Factor</th>
<th>Public</th>
<th>Service Provider</th>
<th>Local Authority</th>
<th>Central Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>People asking for change</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
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<tr>
<td>Champions among policy makers pushing for change</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
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<tr>
<td>Disclosure of information on negative environmental impacts</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
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<tr>
<td>Strategic plan for investment and operations is in place</td>
<td>●</td>
<td>●</td>
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<td>●</td>
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<tr>
<td>Government’s willingness to change and respond quickly to citizen demands and take action</td>
<td>●</td>
<td>●</td>
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<tr>
<td>Channeling the right messages through the right people</td>
<td>●</td>
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"Sanitation is a physical measure that has probably done more to increase human life span than any kind of drug or surgery"

Dr. Deepak Chopra

THANK YOU