PRESENTATION OUTLINE

■ TONE SETTING - SNAPSHOT IN A GLANCE

■ EVOLUTION OF REGULATORY LANDSCAPES

■ PRIVATE SECTOR PARTICIPATION

■ POTENTIAL TAKE AWAY POINTS
## SNAPSHOT OF MALAYSIA’S WATER SERVICES

<table>
<thead>
<tr>
<th>Description</th>
<th>During Independence - 1957</th>
<th>Today - 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>7 million</td>
<td>32 million</td>
</tr>
<tr>
<td>Urban population</td>
<td>30%</td>
<td>75%</td>
</tr>
<tr>
<td>Improved sanitation</td>
<td>4.5%</td>
<td>96% (4% unimproved sanitation)</td>
</tr>
<tr>
<td>Population served by connected services</td>
<td>5%</td>
<td>70%</td>
</tr>
<tr>
<td>Policy Makers</td>
<td>Ministry of Health</td>
<td>Ministry of Water, Land and Natural Resources</td>
</tr>
<tr>
<td>Regulatory Framework</td>
<td>Fragmented</td>
<td>Water and sewerage – 1 regulator</td>
</tr>
<tr>
<td>Sewerage Tariff</td>
<td>No tariff (part of annual assessment)</td>
<td>Monthly billing, Standardized tariff nationwide</td>
</tr>
<tr>
<td>Services</td>
<td>Water – State owned departments</td>
<td>Water – Private companies, state government controlled private company, corporatized government department</td>
</tr>
<tr>
<td></td>
<td>Sewerage – Local Authorities</td>
<td>Sewerage – Private company, federal &amp; state government owned private companies &amp; local authority</td>
</tr>
<tr>
<td>Beneficiaries</td>
<td>Direct user</td>
<td>Community &amp; environment</td>
</tr>
<tr>
<td>Nos of regional STPs</td>
<td>No regional STP</td>
<td>101 regional STPs</td>
</tr>
<tr>
<td>SEWERAGE FACILITIES</td>
<td>QUANTITY</td>
<td>POPULATION EQUIVALENT (PE)</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>----------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Public Sewage Treatment Plant</td>
<td>6,871</td>
<td>25,258,155</td>
</tr>
<tr>
<td>Private Sewage Treatment Plant</td>
<td>3,603</td>
<td>3,373,471</td>
</tr>
<tr>
<td>Communal Septic Tank (CST)</td>
<td>4,359</td>
<td>531,127</td>
</tr>
<tr>
<td>Individual Septic Tank (IST)</td>
<td>1,354,986</td>
<td>6,934,008</td>
</tr>
<tr>
<td>Traditional System</td>
<td>1,154,592</td>
<td>5,772,960</td>
</tr>
<tr>
<td>Network Pumping Station</td>
<td>1,183</td>
<td>n.a</td>
</tr>
<tr>
<td>Length of Sewer Network (km)</td>
<td>20,100</td>
<td>n.a</td>
</tr>
</tbody>
</table>

Source: Malaysia Water Industry Guide 2018

Summation:
- high number of population served by connected services
- a positive note to the environment
- more than 10,000 STPs – causing proliferation of processes & equipment
- leading to logistics and operational mess as well as challenges in allocation of skills and resources
- not cost effective and economically not feasible for facilities smaller than 20,000 PE

Summation as of 2017... cont
- 542,675 nos of enquiries & complaints were recorded by IWK
- Out of which 78% is on billing, 9.8% on desludging services, 5.6% on connected services and 6.6% others.
- IWK has 3,729,506 accounted customers (AC) for connected services.
- The statistics say 1 AC complains on services in average of 0.008 times per year. Effectively that means the likelihood of 1 AC complains once every 125 years in average. Yet 78% of ACs are unhappy with the charges.
- The very desire of connected services became counterintuitive
**UNDER PRICING OF TARIFF**

**Summation**

- Conversion of non mechanize facilities to mechanize systems to improve treatment efficiency
- 87.5% are domestic accounts; 8.6% are commercial accounts; 3.8% are government facilities and 0.1% are industrial accounts
- Revenue from industrial AC break even the OPEX. While 87.5% domestic AC are cross subsidized by commercial and government AC as well as annual subsidy
PRESENTATION OUTLINE

- TONE SETTING - SNAPSHOT IN A GLANCE
- EVOLUTION OF REGULATORY LANDSCAPES
- PRIVATE SECTOR PARTICIPATION
- POTENTIAL TAKE AWAY POINTS
<table>
<thead>
<tr>
<th>Agencies</th>
<th>Legal Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Water Services Commissions (SPAN)</td>
<td>1. Water Services Industry Act (WSIA) 2006</td>
</tr>
<tr>
<td></td>
<td>2. Suruhanjaya Perkhidmatan Air Negara Act (SPAN Act) 2006</td>
</tr>
<tr>
<td>Department of Environment (JAS)</td>
<td>1. Environmental Quality Act (EQA) 1974</td>
</tr>
<tr>
<td></td>
<td>2. Environmental Quality Regulations (Sewage) 2009</td>
</tr>
<tr>
<td>Department of Safety and Health (DOSH)</td>
<td>1. Factories and Machinery Act (FMA) 1967</td>
</tr>
<tr>
<td></td>
<td>2. Occupational Safety and Health Act (OSHA) 1994</td>
</tr>
<tr>
<td>Ministry of Housing and Local Government</td>
<td>1. Street, Drainage and Building Act (SDBA) 1974 (model law)</td>
</tr>
<tr>
<td>Local Authorities (PBT)</td>
<td>1. Uniform Building By Laws</td>
</tr>
<tr>
<td>National Solid Waste Management Department (JPSPN)</td>
<td>1. Solid Waste and Public Cleansing Management Act (SWPCMA) 2007</td>
</tr>
</tbody>
</table>
## EVOLUTION - INSTITUTIONAL STRUCTURE

<table>
<thead>
<tr>
<th>Control</th>
<th>Policy Maker</th>
<th>Regulator</th>
<th>Capital Funding</th>
<th>Operational Funding</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Constitution places sewerage sector under states power</td>
<td>Ministry of Health</td>
<td>Areas within local authority (LA) boundary by LA Areas outside LA boundary by Ministry of Health</td>
<td>By state government, local councils and property developers for area within LA By property developers and federal government for rural area</td>
<td>Through assessment fees and support from state government and local councils By federal government for rural area when required</td>
<td>Areas within local authority (LA) boundary by LA Areas outside LA boundary by Ministry of Health as when required</td>
</tr>
</tbody>
</table>

### Control
- Upto 1993
  - Federal Constitution places sewerage sector under states power
- 1993 - 2006
  - Federal Constitution places sewerage sector under concurrent list. Hence the control of sewerage services became the responsibility of Federal Government
- 2006 onwards
  - Federal Constitution places water services under concurrent list. Hence the control of water services became the responsibility of Federal Government

### Policy Maker
- Upto 1993
  - Ministry of Health
- 1993 - 2006
  - Ministry of Housing & Local Government and later to Ministry of Energy, Water and Communication
- 2006 onwards
  - Ministry of Energy, Water and Communication which later restructured to Minister of Energy, Green Technology and Water and again restructured to Minister of Water, Land and Natural Resources

### Regulator
- Upto 1993
  - Areas within local authority (LA) boundary by LA Areas outside LA boundary by Ministry of Health
- 1993 - 2006
  - Sewerage Services Department
- 2006 onwards
  - National Water Services Commission for both water and sewerage services

### Capital Funding
- Upto 1993
  - By state government, local councils and property developers for area within LA By property developers and federal government for rural area
- 1993 - 2006
  - By Federal Government, concessionaire and private developers for area within LA By property developers and federal government for rural area
- 2006 onwards
  - By Federal Government, SPAN and private developers. Ideally supposed

### Operational Funding
- Upto 1993
  - Through assessment fees and support from state government and local councils By federal government for rural area when required
- 1993 - 2006
  - Through sewerage tariff and federal government subsidy
- 2006 onwards
  - Through sewerage tariff and federal government subsidy

### Services
- Upto 1993
  - Areas within local authority (LA) boundary by LA Areas outside LA boundary by Ministry of Health as when required
- 1993 - 2006
  - Areas within local authority (LA) boundary by IWK as concessionaire Areas outside LA boundary by federal government as when required
- 2006 onwards
  - Areas within local authority (LA) boundary by IWK as concessionaire (based on past regime) New operators are licensed based on service area which covers the whole state. No pockets left unserved.

### Objective of Sewerage Management
- Protecting Public Health
- Protecting Water Resource
- Protecting Environment
INSTITUTIONAL FRAMEWORK ARRANGEMENT – BIRD’S EYES VIEW

WATER SUPPLY SYSTEM

SOURCE
- State Government
- Dept of Environment
- State Government
- Drainage & Irrigation Dept

TREATMENT & DISTRIBUTION
- National Water Resource Council
- State Water Department/ Corporatized
- Private Companies / Concessionaires
- Water Asset Company
- Premise Owner – water meter to sanitary discharge point within premise boundary

CONVEYANCE & TREATMENT
- Operators (public and private including IWK)
- Sewerage Services Dept

DISCHARGE
- State Government
- Dept of Environment
- State Government
- Drainage & Irrigation Dept
INSTITUTIONAL & REGULATORY FRAMEWORK

**Institutional Framework – Separation of Roles**

**Body**
- Federal Government (Ministry of Water, Land and Natural Resources)
- State Government
- National Water Resource Council (NWRC) – chaired by Prime Minister
- National Water Services Commission (SPAN)

**Area of Responsibility**
- Policy matters
- Raw Water matters
- Water Resource matters – Cross boundaries / interstate / issue of National interest
- Regulatory matters

**Description**
- Development and implementation of policy for water services sector
- Regulate raw water abstraction and catchment management
- Coordinate with the various State Government in the management of the water basins.
- Regulate the Water Services industry (Water and Sewerage/Sanitation services)

**Regulatory Framework – Water Services**

- Licensing regime with viable business model and will be measured based on KPIs & benchmarking
- Regulated tariff based on RWA toward full cost recovery
- Competitive bidding
- Integration of water & sewerage services
- Selection of infra – planning & strategy
- Quality of infra – design, construction and T&C
- Performance of product and system
- Consumer standard: Quality of services, rates, deposits etc
- Resolutions of consumer complaints/disputes
- Provision of information-transparency
- Sewerage capital contribution fund
- Water industry fund
- Water Forum
- Environmental aspects
- Public consultation & participation in regulatory functions

**Economic**
- ✓

**Technical**
- ✓

**Consumer**
- ✓

**Social**
- ✓
## Holistic Regulation of Sewerage Services

<table>
<thead>
<tr>
<th>Financing of services</th>
<th>Viable business model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Funding mechanism &amp; licensing regime</td>
</tr>
<tr>
<td>Equitable Tariff setting</td>
<td>Determine tariff</td>
</tr>
<tr>
<td></td>
<td>Billing collection</td>
</tr>
<tr>
<td></td>
<td>Base on KPI and benchmark</td>
</tr>
<tr>
<td>O&amp;M works</td>
<td>Competency of workers</td>
</tr>
<tr>
<td></td>
<td>Quality of assets in total</td>
</tr>
<tr>
<td></td>
<td>Quality of influent</td>
</tr>
<tr>
<td>Required players</td>
<td>Develop required segment</td>
</tr>
<tr>
<td></td>
<td>Qualification &amp; skills &amp; compliance</td>
</tr>
<tr>
<td>Construction quality</td>
<td>Competency contractors</td>
</tr>
<tr>
<td></td>
<td>Construction technical standards</td>
</tr>
<tr>
<td></td>
<td>Inspections requirement</td>
</tr>
<tr>
<td>Products and Material Quality &amp; Performance</td>
<td>Standards and specification</td>
</tr>
<tr>
<td></td>
<td>Obligation of suppliers and manufacturers</td>
</tr>
<tr>
<td>Design of infra works</td>
<td>Standards and specifications</td>
</tr>
<tr>
<td></td>
<td>Competency of designers</td>
</tr>
<tr>
<td>Type infra (on site or connected) and compliance standard</td>
<td>Catchment and development plans</td>
</tr>
<tr>
<td>Sewerage infrastructure selection criteria based on site specific</td>
<td></td>
</tr>
<tr>
<td>Clarity of Roles and Objectives</td>
<td>Legal Framework</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>❑ SPAN Act – functions and operation of regulator</td>
<td>❑ WSI Act – provisions to regulate the sector (regulatory framework)</td>
</tr>
<tr>
<td>Distinctive institutional framework</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Autonomy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>❑ Amendment to Federal Constitution</td>
<td>❑ Moving sewerage and sanitation matters from local &amp; state government to federal government</td>
</tr>
<tr>
<td>❑ Moving water services matter from state government to federal government</td>
<td>❑ Commission comprises of board members from various sector appointed by Minister.</td>
</tr>
<tr>
<td>❑ Can be appointed as commissioner up to 5 terms with 2 years per term</td>
<td>❑ Board decides on matters pertaining to regulatory and operation of the Commission</td>
</tr>
<tr>
<td>❑ Commission is funded thorough permit and licensing fees</td>
<td></td>
</tr>
</tbody>
</table>
## SPAN AS SERVICES REGULATOR #2

<table>
<thead>
<tr>
<th>Accountability</th>
<th>Participation &amp; Transparency</th>
<th>Predictability</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Commission can sue and can be sued</td>
<td>□ Provided for formation of Water Forum to encourage stakeholder input</td>
<td>□ Functions and roles determine through SPAN Act. Any changes must be</td>
</tr>
<tr>
<td>□ Provided for formation of tribunal to resolve disputes among regulated stakeholders</td>
<td>□ Provided for public consultation process before Commission’s directions or decisions.</td>
<td>through amendment of the Act</td>
</tr>
<tr>
<td>□ Provided for formation of appeal tribunal at Ministry’s level for appeals against Commission’s decisions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Industry performance report to be submitted to Minister annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Financial account to be tabled to Parliament</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Minister can only make general direction. Commission makes specific directions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functions Sanitation Submarket</td>
<td>Financing</td>
<td>Planning and Design</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------</td>
<td>---------------------</td>
</tr>
<tr>
<td><strong>Sewer-based Sanitation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sewage Conveyance</td>
<td>Government/ Private Developers</td>
<td>Professionals SPAN (approvals)</td>
</tr>
<tr>
<td>Industrial/ Prohibited Effluent Discharged into Public Sewer</td>
<td>Market Driven</td>
<td>Professional SPAN (approvals)</td>
</tr>
<tr>
<td>Sewage Treatment</td>
<td>Government/ Private Developers</td>
<td>Professionals SPAN (approvals)</td>
</tr>
<tr>
<td><strong>On-site Sanitation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onsite Sanitation Facility</td>
<td>Government/ Private Developers</td>
<td>Professionals SPAN (approvals)</td>
</tr>
<tr>
<td>Faecal Sludge Desludging Services</td>
<td>Operator</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Treatment of Faecal Sludge</td>
<td>Operator</td>
<td>Professionals SPAN (approvals)</td>
</tr>
<tr>
<td>Re-use of Faecal Sludge</td>
<td>Market Driven</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Regulatory Functions Sanitation Submarket</td>
<td>Price Regulation</td>
<td>Service Quality Regulation</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Sewer-based sanitation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sewage Conveyance</td>
<td>SPAN</td>
<td>SPAN</td>
</tr>
<tr>
<td>Industrial/ Prohibited Effluent Discharged into Public Sewer</td>
<td>SPAN (certain segments)</td>
<td>SPAN</td>
</tr>
<tr>
<td>Sewage Treatment</td>
<td>SPAN</td>
<td>SPAN (Services) DOE (Effluent standards)</td>
</tr>
<tr>
<td>On-site sanitation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onsite Sanitation Facility</td>
<td>Market Driven</td>
<td>SPAN</td>
</tr>
<tr>
<td>Faecal Sludge Desludging Services</td>
<td>SPAN</td>
<td>SPAN</td>
</tr>
<tr>
<td>Treatment of Faecal Sludge</td>
<td>SPAN</td>
<td>SPAN DOE (Disposal sites)</td>
</tr>
<tr>
<td>Re-use of Faecal Sludge</td>
<td>None</td>
<td>Not Determined</td>
</tr>
</tbody>
</table>
MALAYSIA’S TOOLS FOR QUALITY REGULATIONS

• Command & control (Heavily used)
  • As most of the infrastructure is funded and constructed by private sector before handing over to public operator for operations and maintenance.
  • As the community benefits supersedes individual benefits
  • Almost all stakeholders & scope of work within whole service chain of WSS are captured & addressed through regulations, guidelines, standards, KPIs etc.
  • Input regulatory is convenient and familiar compared to output regulatory which is a new territory
  • To balance, use RIA as a tool which incorporates public consultations and cost benefit analysis to establish overall impact of the regulations (but largely not used effectively)

• Regulations by incentives (yet to implement)
  • Studying this approach for certain areas, especially resource recovery and water industry fund
IDENTIFYING THE ‘RIGHT’ REGULATORY DESIGN

Any form of regulatory design in simple term is government’s interference in businesses. Hence “WHY” and “HOW” is essential to achieve the objective of interference with least impact to overall economy.

Country context / administrative and legal traditions affects the selection of regulatory design.
CASE STUDY: DESLUDGING SERVICES REGULATORY FRAMEWORK #1

BOD LOADING AGAINST PE IN LANGAT RIVER BASIN IN 2007

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Public STPs</th>
<th>Private STPs</th>
<th>Pourflush &amp; ISTs</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE</td>
<td>83.0%</td>
<td>5.3%</td>
<td>5.3%</td>
<td>11.8%</td>
</tr>
<tr>
<td>BOD</td>
<td>37.6%</td>
<td>33.6%</td>
<td>5.0%</td>
<td>23.8%</td>
</tr>
</tbody>
</table>

COMPARISON OF POLLUTION LOADING

IST (After 1 Years) IST (After 2 Years) IST (After 3 Years) CST EA
Power to cause private septic tanks to be cleansed, etc.
22. The Director General shall cause private septic tanks in areas from time to time prescribed by the Minister to be properly cleared, cleansed and emptied.

Duty of owner to operate and maintain private sewerage system or septic tank
25. (1) The owner or occupier of any premises having a sewerage system or septic tank shall—
(a) ensure adequate access to the septic tank for the purpose of enabling the septic tank to be serviced and desludged;
(b) cause the septic tank, the private connection pipe and all accessories thereto to be so maintained and kept as not to be a nuisance or harmful to health; and
(c) cause the septic tank to be desludged and, in the case of a private sewerage system, to be serviced or maintained by a service licensee or permit holder at such intervals and in such manner as may be prescribed; and
(d) grant the service licensee or permit holder adequate access to the private sewerage system for the purposes of enabling the private sewerage system to be inspected, serviced or maintained.

(3) A person who contravenes subsection (1) commits an offence and shall, on conviction, be liable to a fine not exceeding fifty thousand ringgit.

Septic tanks to be desludged
44. (1) The service licensee operating and maintaining a public sewerage system shall desludge the septic tanks in its sewerage services areas from time to time as may be prescribed.
(2) The service licensee who fails to comply with its obligations under subsection (1) commits an offence and shall, on conviction, be liable to a fine not exceeding fifty thousand ringgit.

Duty to operate and maintain private sewerage system, etc.
65. (1) The owner, management corporation or occupier of any premises having a private sewerage system or septic tank shall—
(a) grant the service licensee or permit holder adequate access to the septic tank for the purpose of enabling the septic tank to be serviced and desludged;
(b) cause the private sewerage system, septic tank, the private connection pipe, individual internal sewerage piping, common internal sewerage piping and all accessories thereto to be so maintained and kept as not to be a nuisance or harmful to health;
(c) cause the septic tank to be desludged and, in the case of a private sewerage system, to be serviced or maintained by a service licensee or permit holder at such intervals and in such manner as may be prescribed; and
(d) grant the service licensee or permit holder adequate access to the private sewerage system for the purposes of enabling the private sewerage system to be inspected, serviced or maintained.

(3) A person who contravenes subsection (1) commits an offence and shall, on conviction, be liable to a fine not exceeding fifty thousand ringgit.
1. Prior to 1993, when sewerage services are under the control of local authorities; desludging was performed based on demand
2. After 1993, the sewerage services control moved to federal government and scheduled desludging was rolled out.
3. Extensive campaigns and awareness programs were conducted to increase the acceptance of scheduled desludging
4. After 14 years of scheduled desludging with the obligation to perform by IWK as the concessionaire – liberalisation concept was introduced.
5. Liberalisation concept allows premise owner to use the services of IWK or any desludging contractor for the scheduled desludging activity.
6. From 100,000+ AC desludging dropped to about 20,000 AC
7. About 32% of PE is served by IST, CST and traditional systems which requires periodic desludging as of 2017 data
8. Ideally at 3 years of periodic desludging about 600,000+ septic tanks should be desludged annually

THE PROPOSED SOLUTION

<table>
<thead>
<tr>
<th>ITEM</th>
<th>BEFORE 2008</th>
<th>AFTER 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obligation</td>
<td>Owner</td>
<td>Owner</td>
</tr>
<tr>
<td>Services by</td>
<td>IWK or contractor appointed by IWK</td>
<td>IWK or SPAN permit E holder</td>
</tr>
<tr>
<td>Service Duration</td>
<td>Once every 2 years</td>
<td>Once every 3 years</td>
</tr>
<tr>
<td>Service Requirement</td>
<td>Any time throughout service period</td>
<td>As and when needed</td>
</tr>
<tr>
<td>Service Charge</td>
<td>Monthly at RM 6/ month @ RM 144 / 2 years</td>
<td>RM 230 for each services @ RM 6.40/ 3 years</td>
</tr>
</tbody>
</table>
**CASE STUDY: DESLUDGING SERVICES REGULATORY FRAMEWORK #4**

### THE ISSUES

- The basis for liberalization concept
  - IWK was not interested in desludging business due the problems listed below
  - The cost of desludging by IWK is high hence high refusal rate
  - Introducing competition/alternative options for septic owners will increase desludging rate
  - The alternative options will bring desludging cost lower

- The problems IWK faced since 1993
  - Refusal From Owners
  - Location Inaccessible and septic tank covers sealed
  - Owner Not In During Visit
  - Septic Tank Not Found/ Missing
  - Premise Not Found or unoccupied
  - Non Standard Septic Tank

### NATURE OF FAILURE

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Attempted</th>
<th>Total Unsuccessful</th>
<th>Total Deslugged</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2006</td>
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<td>2007</td>
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<tr>
<td>2008</td>
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<td></td>
<td></td>
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<tr>
<td>2009</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SCHEDULED DESLUDGING**

- INITIATED BY IWK
- LIBERALISATION CONCEPT INITIATED BY OWNERS

**Total Attempted**

**Total Unsuccessful**

**Total Deslugged**
CASE STUDY: DESLUDGING SERVICES REGULATORY FRAMEWORK #5

IT WENT REALLY WRONG

INDIVIDUAL SEPTIC TANK (IST) DESLUDGING TREND (2005 – 2017)

Before 2008, desludging service provider were more proactive in planning and executing the services

Substantial DECLINE

Before 2008, desludging service provider were more proactive in planning and executing the services

THE ACTUAL ISSUE AND IMPACT OF LIBERALIZATION

✓ The actual issue
✓ Wrong framing of the problem
✓ Lack of regulatory support
✓ Dependent on IWK’s feedback rather than independent study by regulator
✓ Permit holders unhappy with IWK

✓ Impact of liberalization – based on an independent study
✓ If the revenue declines by 5%, after tax IRR plunges to 0%
✓ Expected to trigger losses to medium scaled operator within 2 years and large operator within 5 years
✓ 96% of respondents in a survey conducted are not willing to pay more than RM 250 for the desludging services

✓ Other challenges
✓ Undone 15 years worth of work
✓ Enforcement on approximately 340,000 users who do not desludge septic tanks on schedule
✓ Conflicts within community connected to CST

INDIVIDUAL SEPTIC TANK (IST) DESLUDGING TREND (2005 – 2017)
Analysis shows desludging cost is RM 227/m³ base on 2013 data
### Case Study: Desludging Services Regulatory Framework #7

#### Considered Tarif Structure

<table>
<thead>
<tr>
<th>Option I</th>
<th>Option II</th>
<th>Option III (proposed)</th>
<th>Option IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Same rates for all category; ➢ Huge impact to residential consumers; ➢ IWK would earn profit with high profit margin more than 20%</td>
<td>➢ Non-residential rates higher than residential; ➢ Proposed rates lower than existing rates for residential (charged by MAJAARI); ➢ Revenue insufficient to cover OPEX; ➢ IWK would incur losses more than 20%</td>
<td>➢ Non-residential rates higher than residential; ➢ Huge impact to residential consumers (90% of total accounts are residential); ➢ Rates for residential based on 30m³ water consumption is more than average usage for residential consumers i.e. 48.5% below 20m³ (desludging bill higher than connected bill of majority of residential consumers) ➢ IWK earns reasonable profit margin around 10%</td>
<td>➢ Non-residential rates higher than residential; ➢ All consumers (desludging &amp; connected) paying based on the same concept i.e. usage of water; ➢ Revenue insufficient to cover OPEX; ➢ IWK would incur losses around 10%;</td>
</tr>
</tbody>
</table>

- Average bill residential : RM18.92 / month;
- Average bill residential : RM9.60 / month;
- Average bill : RM15.00 / month;
- Average bill residential : RM8.00 / month;

#### Proposed Framework

- Scheduled desludging services to be planned and implemented by public operators
- Legal action on owners for refusal of desludging services
- Creation of vendor program by operator to enable business growth of permit holders to provide the necessary support
- Tariff concept based on water usage volumetric charges with same tariff structure with connected services as 43% of revenue from desludging services is used to support connected services.
- Unsuccessful trips of desludging tanker
- Pricing policy under the principle of ‘user pay’ and to encourage efficient use of water;
- Same regulations and implementation date for both connected and desludging services;
- To minimize impact on tariff increase, government to continue subsidy to IWK for period until they achieve full cost recovery of OPEX.
- To recommend to Minister on implementation of joint billing to achieve collection efficiency.
Data gathering (facts) – Physical and Non Physical data

- **Physical**
  - Growth of on-site systems and locality
  - Performance of on-site systems (technology)
  - Sludge generation and treatment
  - Environmental impact – river water quality, disposal sites,

- **Non Physical**
  - Affordability of services and pricing
  - Acceptance of demand (reactive) and schedule (preventive) desludging
  - Competent and sufficient sector players – regulators, operators and contractors
  - Resource recovery options

Provide Legal Enablers For Fundamental Principles

- Sec 44 (1) Obligation of service licensee to desludge septic tanks as prescribed
- Sec 65 (1) ....Service licensee or permit holder must be given access for the purpose of desludging
- Non compliance can be subjected to imprisonment and fines
PRESENTATION OUTLINE

- TONE SETTING - SNAPSHOT IN A GLANCE

- EVOLUTION OF REGULATORY LANDSCAPES

- PRIVATE SECTOR PARTICIPATION

- POTENTIAL TAKE AWAY POINTS
WHERE IS THE MONEY – CAPEX & OPEX

- Low Tariff
- Capital Intensive Industry
- Lack of CAPEX Funding
- Minimal maintenance programs & infrastructure development
- High Outstanding Loan
- Inefficient and ineffective Service Delivery

Unprofitable and require substantial funding from Federal Government and private developers.

Requires business models to transform the industry for long term sustainable operations.

Corporatization will lead to managerial/financial autonomy clearer accountability.

Key Drivers for the Reforms

Two fundamental issues in the water industry are efficiency and effectiveness and funding. These factors are interlinked.

Key Objectives:
- Promote efficiency and effectiveness in the industry
- Derive a sustainable business model in long term that meet the interest of all stakeholders
- Adequately addressing the long term funding issue

Key Drivers for the Reforms:

- Efficiency and Effectiveness
- Funding

Key Objectives:

- Full Economic Cost
- Full Cost

Environmental Cost
- Opportunity Cost
- CAPEX
- OPEX

Upstream Cost
Downstream Cost
PAAB
Operator

SPAN

• Owner of water assets
• Source for competitive funding (cheap and long term finance)
• Transparent procurement procedures and process

Licensed & regulated

Transfer asset & liability

Rental assets

Operations and maintenance of:
• Treatment
• Distribution

PAAB

NEW ASSET LIGHT MODEL

SEWERAGE CAPITAL INVESTMENT

GOVERNMENT FUNDED

• 5 years National Plans
• G to G, PPP and PFI
• Funding for poor (MOH)

CONCESSIONAIRE OR STATE FUNDED

• Soft Loan & Grants
• Built into Tariff Structure

DEVELOPER FUNDED

• Through Land & Property Development
• Makes Sewerage Capital Contribution

NEW ASSET LIGHT MODEL

EXISTING MODEL

WATER ASSET MANAGEMENT COMPANY

ASSET-LIGHT OPERATOR

SEWERAGE CAPITAL INVESTMENT

O & M INVESTMENT

GOVERNMENT FUNDED

• Subsidy

SERVICE LICENCEE FUNDED

• Tariff Collection
Note:
*Amount allocation for water supply is not available
**For RMK-11, amount refers to shortlisted project for Rolling Plan No. 1 and subject to approval by EPU/KETTHA.

Sources: Laporan Rancangan Malaysia, RMK 1-10 issued by the Economic Planning Unit (EPU). Official website of Kementerian Penerangan Komunikasi dan Kebudayaan (KPKK), Kementerian Tenaga, Teknologi Hijau dan Air (KeTTHA), Pejabat Perdana Menteri (PPP), Malaysian Administrative Modernisation and Management Planning Unit (MAMPU), Utusan, STAR, New Straits Times (NST), Wikipedia, etc
**INVESTMENT FOR SEWERAGE INFRASTRUCTURE**

- Base on current goals and approach and estimated RM 50 bil for next 30 years (RM 1.7bil/year for West Malaysia)

- Current RMK allocation is about RM 500 mil for Malaysia (about RM 250 mil for WM)

- SCC funds averaging about RM 250 million annually and cumulatively amounting more than RM 2 billion to-date since 2011

- Investment from private sector averaging about RM 500 million annually – diluted and not used strategically. Which currently causing more problems than delivering solutions

- Private developer funding should be consolidated and utilized through SISCA matrix.

- Whole life cycle cost of the works and services should be main consideration

- Short fall of strategic funding (government + SCC) about RM 1.2 bil a year. Net short fall (including private sector) = RM 200 mil a year

---

**Type of Sewerage Capital Contribution** | **Amount (RM)**
--- | ---
Connection | RM 316, 194, 731
Septic Tank | RM 12, 780, 581
Upgrading | RM 5, 466, 117
Sludge Treatment Facility | RM 2, 949, 364
Total for 2016 | RM 337, 390, 793
PLANNING GUIDELINE: SEWERAGE INFRASTRUCTURE SELECTION CRITERIA (SISCA)

Economic Dynamic Influencer + Socio Ecological Influencer = SISCA Matrix

Thrust 1 – Overriding Criteria & Economic Feasibility
Thrust 2 – Safety & Public Health
Thrust 3 – Protection of Environmental and Water Source

SSM study includes:
~ Population equivalent tabulation for various types of building use
~ Q peak factor and sewage generation per capita
~ Trends and pattern of sewage quantity and quality for various types of development

TILL TO DATE:
1. 150 PE AND ABOVE MUST CONSTRUCT STP SINCE 1994
2. BASE ON THE PE TABULATION ESTABLISHED IN LATE 1980’S
PLANNING GUIDELINE: SISCA – ECONOMIC DYNAMIC INFLUENCER

1. CONNECT if have existing facility nearby

2. If connection cost exceeds above 20% yardstick cost, then refer to overriding criteria 3.

3. ECONOMIC FEASIBILITY (everything in exception to 1) - ST or STP

Feasible Operating Cost consists of:
- Regulatory cost
- Monitoring operators
- Monitoring users
- Environmental cost
- Failure on compliance

CAPEx (Including Land)

OPEX (ST vs STP)

Holistic Whole Life Cycle Cost of Sewerage Infrastructure and Services
PLANNING GUIDELINE: SISCA – SOCIO ECOLOGICAL INFLUENCER

Criteria 1 – 4
Safety & Public Health

Criteria 5 – 7
Protection of Environment & Water Resource

01 Urbanisation
02 Population Density
03 Population Growth Rate
04 Strategic Importance
05 River/Dam/ Groundwater Usage
06 River Water Quality
07 Assimilative Capacity

Sewerage Strategy Matrix (SSM)
<table>
<thead>
<tr>
<th>No.</th>
<th>CRITERIA</th>
<th>RANGE</th>
<th>WEIGHTAGE RANGE</th>
<th>SCORE RANGE</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Urbanization (10%)</td>
<td>Rural Outside local authority area</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Small town Within local authority area (other small towns besides the District Capital)</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>District Capital (e.g. Majlis Perbandaran Klang) District Capital/Town</td>
<td>3</td>
<td>4</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>State capital Administrative Capital of the State (e.g. MBSA)</td>
<td>4</td>
<td>5</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Major city All major cities with population above 500k (based on the Statistical Department of Malaysia)</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Population density (10%)</td>
<td>very low &lt;100 people/km²</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>low 101-500 people/km²</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>medium 501-1000 people/km²</td>
<td>3</td>
<td>3</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>high 1001-1500 people/km²</td>
<td>4</td>
<td>4</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>very high &gt;1500 people/km²</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Population Growth Rate (10%)</td>
<td>low &lt; 1%</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>medium 1-3%</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>high &gt; 3%</td>
<td>3</td>
<td>3</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>Strategic importance (10%)</td>
<td>Agriculture Outside local authority area</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Industrial Factories</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Administrative &amp; Economic Centre Town and cities</td>
<td>3</td>
<td>3</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Residential Housing area</td>
<td>4</td>
<td>4</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tourism Tourist attraction</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>River/Dam/ Groundwater Water Use (25%)</td>
<td>Nil No usage</td>
<td>1</td>
<td>1</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non Potable - Not Critical No / minimal body contact</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>175</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non Potable - Critical Anything involves body contact (tourism / recreational, aquaculture / ablution)</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Potable Water For drinking purposes</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>River water quality (15%)</td>
<td>Class V None of the rest</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class IV Irrigation</td>
<td>2</td>
<td>2</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class III Extensive treatment required for water supply &amp; fishery</td>
<td>3</td>
<td>3</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II Conventional treatment required for water supply &amp; fishery</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class I Treatment not required for water supply &amp; fishery</td>
<td>5</td>
<td></td>
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</tr>
</tbody>
</table>
PRESENTATION OUTLINE

■ TONE SETTING - SNAPSHOT IN A GLANCE

■ EVOLUTION OF REGULATORY LANDSCAPES

■ PRIVATE SECTOR PARTICIPATION

■ POTENTIAL TAKE AWAY POINTS
Take Away Points #1

- Rely on DATA & FACTs – opinions leave it at coffee table
- Effective, sufficient and meaningful consultation with all the stakeholders in drafting and implementation of policies.
- Depoliticize segments that are politically sensitive. Unload the pressure of political masters.
- Create vibrant environment to attract private sector participation. There is not a single problem a government faces can be resolved by government alone. Leverage to accelerate growth.
- Identify industry and sectoral champions. Essential to drive forward
- Starting some where is better than not starting at all.
Take Away Points #2

- Procedures are not regulatory objectives and outcomes
- Strategic structural changes at organizational and institutional levels
- Power MUST BE with responsibility & accountability – hold government agencies and regulators accountable
- Allocation of skills and resources must be appropriate to the entities, roles and responsibilities. Reassign or second officers to relevant agencies. Don’t reassign the tasks and functions to the preferred agencies.
- **Enforcement!!!** compound someone is good and sending someone behind bars is better
- Constant... constant... constant.... competency building
Thank You

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Punita Nook Naidu