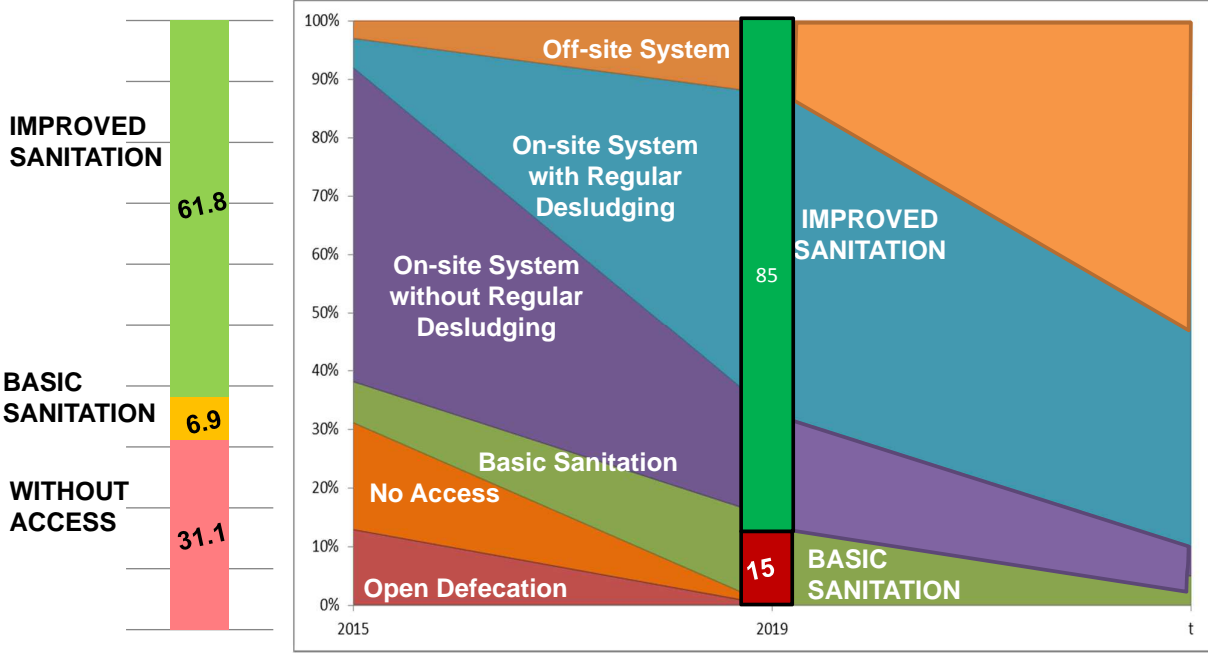


## SEWERAGE DEVELOPMENT IN INDONESIA

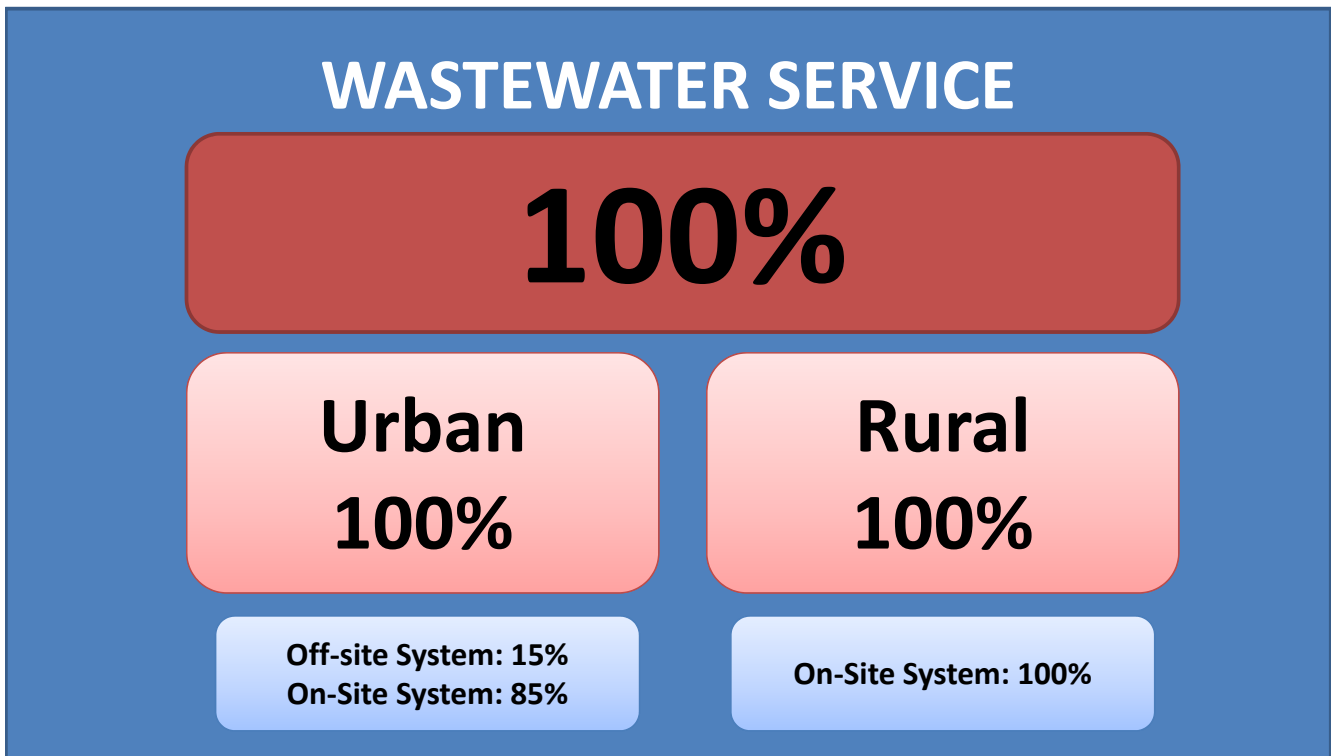
Nanda Lasro Elisabet SIRAIT, Section Head of Specific Environmental and Sanitation Subdirectorate, Directorate General of Human Settlements, Ministry of Public Works and Housing (MPWH) Republic of Indonesia

Conference on Watershed Management  
for Controlling Municipal Wastewater in South East Asia

## CURRENT CONDITIONS AND FUTURE TARGETS



# 2019 Universal Access



3

## ISSUES AND CHALLENGES



Up-stream

- > 95% of domestic wastewater is managed by on-site system (septic tank and septage treatment), with low quality
- Low awareness of hygiene and sanitation in communities
- Low quality of sanitation facility
- Low access to sanitation facility
- Limited land availability in slum urban area



Down-stream

- Polluted water sources
- Low effluent quality from on-site system
- High cost of investment, operational and maintenance for off-site system
- Non-functional existing sanitation facility

- Low priority on sanitation investment, both at government and community level (land availability, planning, commitment)
- **Stronger regulation and enforcement is needed !!!**

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# SANITATION DEVELOPMENT PLANNING

## City Sanitation Strategy (SSK) & WASTEWATER MASTERPLAN/OUTLINE PLAN

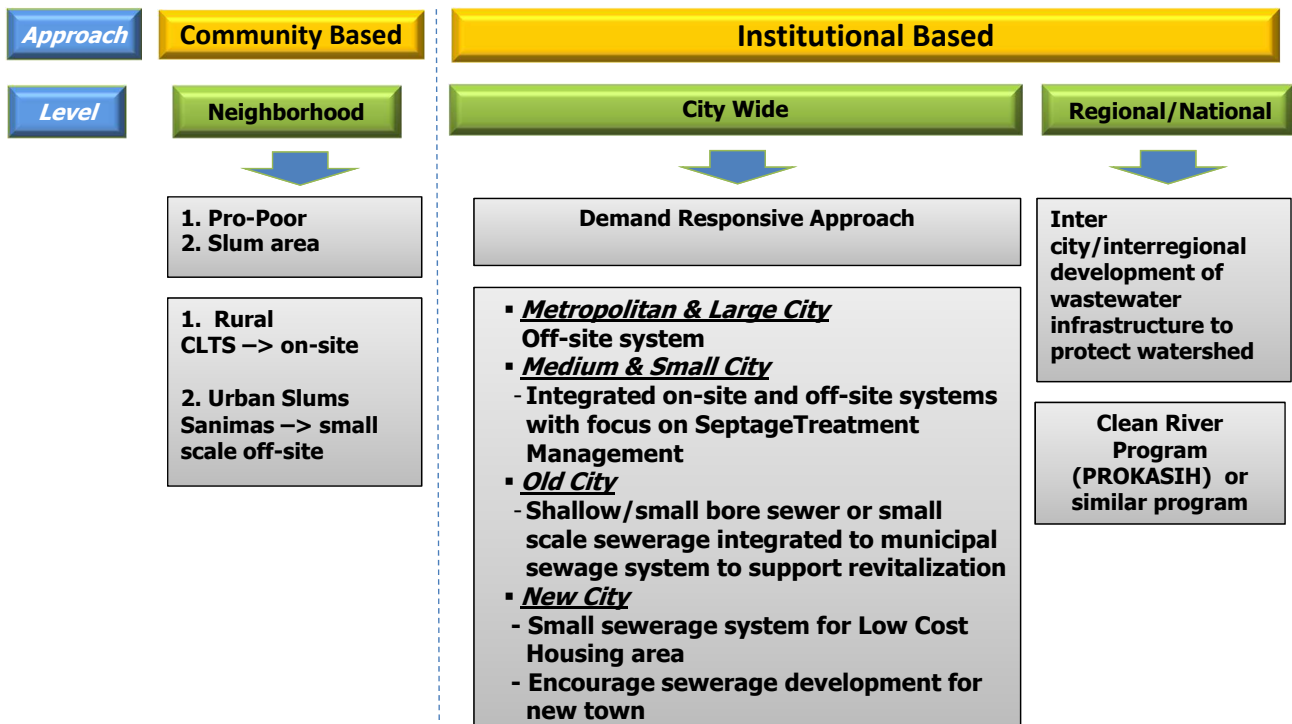


# SANITATION DEVELOPMENT SCHEME

| URBAN/RURAL - DENSITY |              | WASTEWATER SYSTEM                                     |  |
|-----------------------|--------------|---|--|
| URBAN                 | LOW DENSITY  | On-site system  | URBAN-CLTS                                 |
|                       | HIGH DENSITY | Off-site system (communal, decentralized, city scale) |  |
| RURAL                 | LOW DENSITY  | Latrines<br>Septic tanks (basic Sanitation)           | Community Lead to Total Sanitation ((CLTS) |
|                       | HIGH DENSITY | On-site<br>Communal Off site                          |  |



# MANAGEMENT APPROACH



7



# WHAT DO WE DO ???

## Develop:

### – On-site System

- Individual Septic Tank
- Communal Septic Tank
- Septage Transport Vehicle
- Septage Treatment Plant

### – Off-site System

- City Scale
- Small Scale
- Specific Area

## Encourage:

1. Campaign, Education, and Promotion
2. Advocacy to Local Governments
3. Management Technical Assistance
4. Updating City Sanitation Strategies
5. Cross Sectoral Synchronization
6. Human Resources Development

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## **Prior to 2015**

- Strengthening provincial government roles
- Improving quality cities sanitation strategic plan
- Promoting awareness of and proper attitude towards sanitation and hygiene at users and management

## **2015 onwards: focusing on implementation**

- Full support form the central national
- More than 350 districts/cities with sanitation strategic plan

## **100% coverage of basic infrastructure, including sanitation in 2019**

- Continuing Open Defecation Free Program
- Improving quality of septage *management*
- *Increasing coverage of off-site system in urban areas*

9

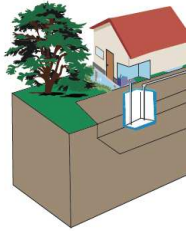
## **ESTIMATION OF INFRASTRUCTURES NEEDED FOR UNIVERSAL ACCESS**

| <b>OFF SITE SYSTEM</b>  | <b>ON SITE SYSTEM</b>   |
|---|---|
| <b>Target by 2019: 2 million Household</b>  | <b>Target by 2019: 20 million Household</b>   |
| <ul style="list-style-type: none"> <li>- House Connection Construction in <b>13</b> existing city scale WWTP (exclude MSMHP and MSMIP): <b>150.000 HC</b></li> <li>- House Connection Construction in City Scale WWTP (<b>Jambi, Pekanbaru, Makassar, DKI Jakarta, Medan, Yogyakarta</b>): <b>150.000 HC</b></li> <li>- Small Scale WWTP Construction: 2.400 unit (@200 – 1000 HC): <b>1,2 million HC</b></li> <li>- Community based WWTP Construction: 5.000 unit (@100 HC): <b>500 ribu HC</b></li> </ul> | <ul style="list-style-type: none"> <li>- Septage Treatment Plants Construction: <b>337 cities/regencies</b></li> <li>- Septage transport vehicle supporting: <b>337 units</b></li> <li>- Septic tank construction: <b>10 million HH</b></li> <li>- Public Toilet Construction (Communal septic tank): 50.000 unit (@50 KK): <b>2,5 million HH</b></li> <li>- Latrine (Basic Sanitation): <b>7,5 million HH</b></li> </ul> |



# SEPTAGE MANAGEMENT SYSTEM

For Onsite & Small scale sewerage, beside expanding the access we are now also focussing on **IMPROVING the QUALITY of SEPTAGE MANAGEMENT**



**Wastewater Treatment:**  
○ Individual Septic Tank  
○ Comunal Septic Tank  
○ Small Scale Sewerage

**Septage Transport Vehicle**

**Septage Treatment Plant**  
**Only 170 out of 517 cities/regencies owned STP**

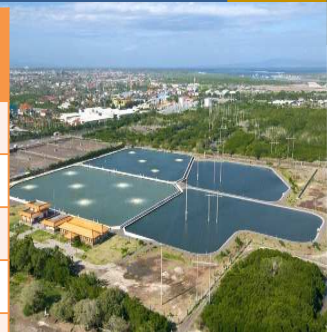
**On Call Basis Desludging / Regular Desludging**

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# CITY SCALE SEWERAGE IN INDONESIA

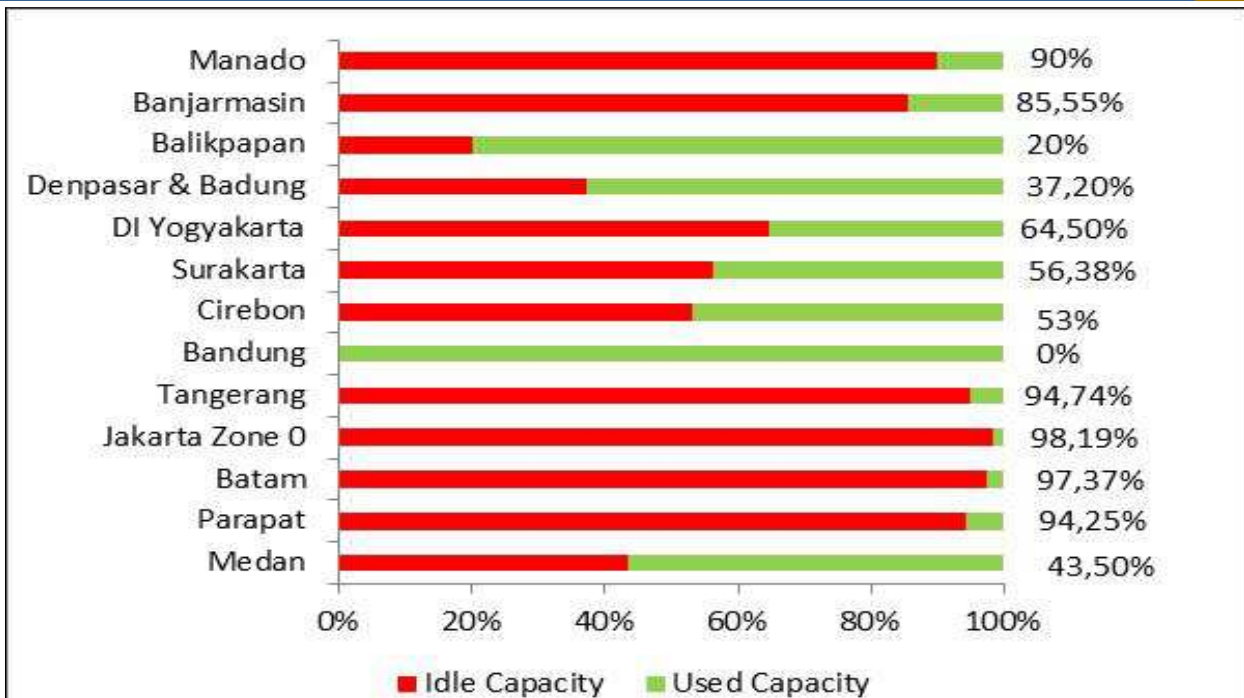
| No | City              | Units | System              | Capacity (CMD) | Idle Capacity |
|----|-------------------|-------|---------------------|----------------|---------------|
| 1  | Medan             | 1     | UASB                | 10.000         | 43,5 %        |
| 2  | Parapat           | 1     | Aerated Ponds       | 2000           | 94,25%        |
| 3  | Batam             | 1     | Oxidation Ditch     | 2.852          | 97,37%        |
| 4  | Jakarta Zone 0    | 1     | MBBR                | 38.880         | 98,19%        |
| 5  | Tangerang         | 1     | Aerated Ponds       | 2.800          | 94,74%        |
| 6  | Bandung           | 1     | Lagoons             | 80.835         | 0%            |
| 7  | Cirebon           | 4     | Lagoons             | 20.500         | 53%           |
| 8  | Surakarta         | 3     | Biofilter & Lagoons | 14.000         | 56,38%        |
| 9  | DI Yogyakarta     | 1     | Aerated Ponds       | 15.500         | 64,5%         |
| 10 | Denpasar & Badung | 1     | Aerated Ponds       | 51.000         | 37,2%         |
| 11 | Balikpapan        | 1     | Aerated Ponds       | 800            | 20%           |
| 12 | Banjarmasin       | 7     | RBC                 | 18.000         | 85,55%        |
| 13 | Manado            | 1     | RBC                 | 2.000          | 90%           |



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## BIG QUESTIONS: HOW TO UTILIZE THE IDLE CAPACITY????



Problems: Low Awareness of the Households Owners, Low Budget for house connections from Local Government, No law enforcement

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## ON GOING DEVELOPMENT OF CITY SCALE SEWERAGE IN INDONESIA



Banda Aceh → National Budget

Jambi, Pekanbaru & Makassar → ADB Loan & National Budget

Palembang → IndII Grant & National Budget

Batam → EDCF Loan

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## UPCOMING OPPORTUNITIES OF SEWERAGE IN INDONESIA



**Bandar Lampung, Bogor & Surabaya** → Masterplan, Feasibility Study & Detailed Engineering Design (DED) already available

**DKI Jakarta** → Masterplan & Feasibility Study for Zone 1 & 6 available, DED for Zone 2,3,4,5,7,8,10 are on process

**Greater Bandung** → Preparation of Study for WWTP upgrading & coverage expansion

**Denpasar** → DED for WWTP upgrading and urgent area are on process

**Ternate** → Land Preparation are on Process

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## CHALLENGES ON EXPANDING CITY SCALE SEWERAGE COVERAGE

- Land Availability
- High CAPEX & OPEX vs Limited Budget on Central & Local Budget
- Limited Human Resources on Sanitation Sectors
- Needs of Regulation & Law Enforcement
- Awareness of the Community

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## EXPECTED TECHNOLOGIES

**A city scale sewerage system requires high investment cost, the needs for appropriate technology for tropical climate with a relatively low in operation and maintenance costs have never been more urgent**



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## BLUE BOOK 2015- 2019

### **Development of Waste Water Management Program**

Total: USD 3.583.000.000

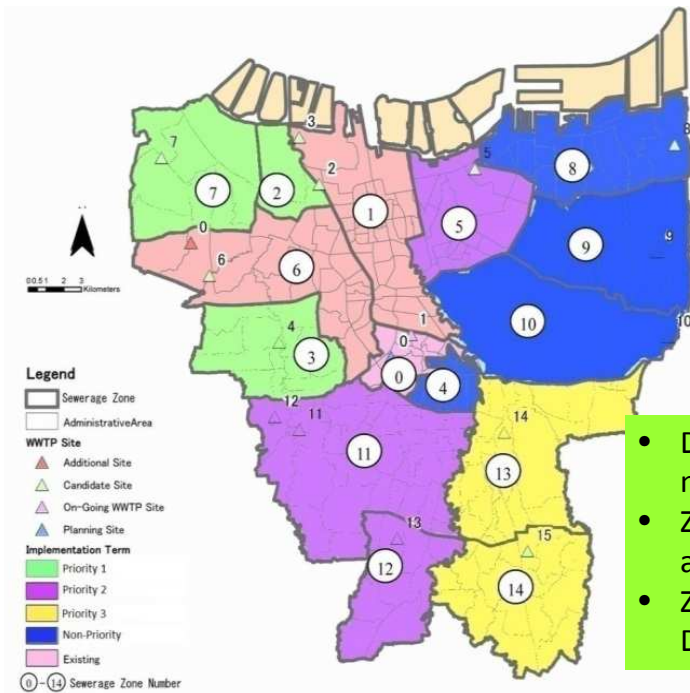
- |   |   |
|---|---|
| 1 | Community Based Sanitation Program (SANIMAS)                                |
| 2 | Jakarta Sewerage Development Project - Zone 1 and Zone 6                    |
| 3 | The Development of Sewage Treatment Plant Facility in Priority Area         |
| 4 | Sewerage System Development in Indonesia                                    |
| 5 | Denpasar Sewerage Development Project - Phase III                           |
| 6 | The Development and Optimization of Wastewater Treatment in Greater Bandung |
| 7 | Engineering Service for City-Wide Sanitation Improvement                    |

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# DKI JAKARTA SEWERAGE

The acceleration process of Jakarta Sewerage (to support NCICD) shift the priority of WWTP Zones

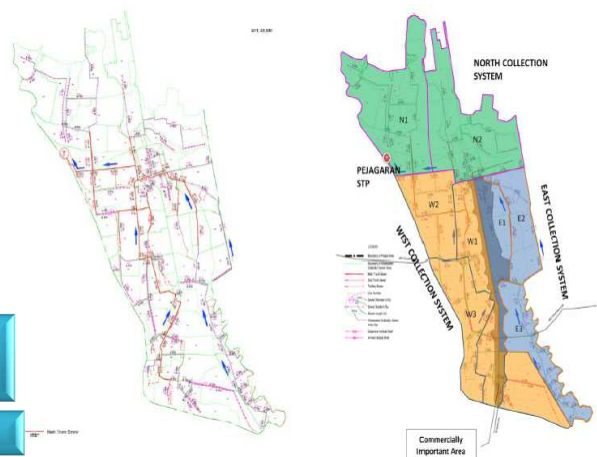
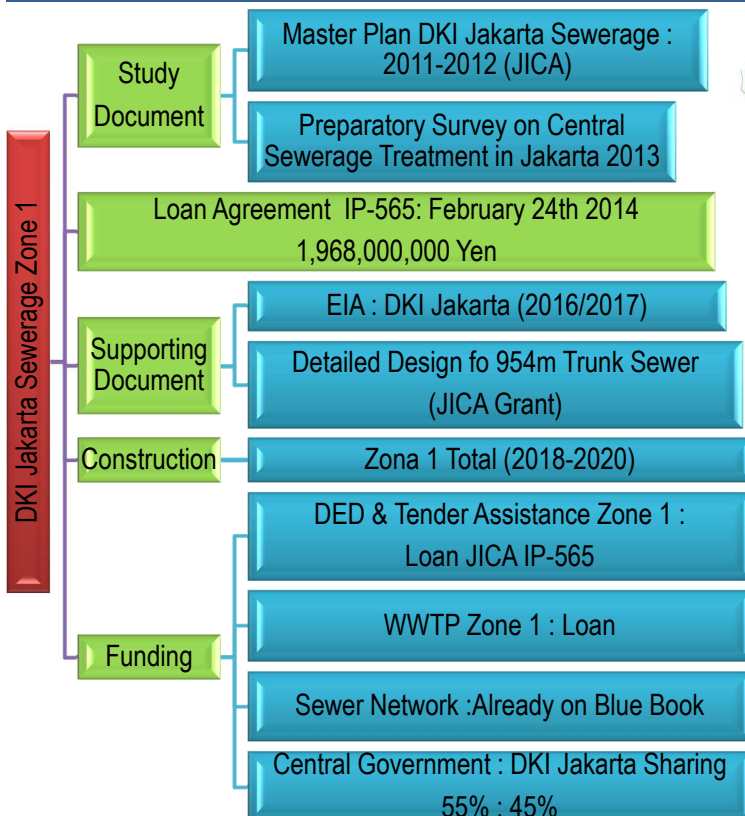


| Zone  | Location of WWTP           | Priority on Masterplan | Priority on Acceleration |
|-------|----------------------------|------------------------|--------------------------|
| No.1  | Waduk Pluit                | Short                  | 1                        |
| No.2  | Muara Angke                | Long                   | 2                        |
| No.3  | Srengseng City Forest Park | Long                   | 2                        |
| No.4  | Tebet                      | Mid                    | 5                        |
| No.5  | Danau Sunter               | Mid                    | 3                        |
| No.6  | STP Duri Kosambi           | Short                  | 1                        |
| No.7  | Kamal - Pegadungan         | Long                   | 2                        |
| No.8  | Marunda                    | Mid                    | 5                        |
| No.9  | Rorotan                    | Long                   | 5                        |
| No.10 | STP Pulo Gebang            | Mid                    | 5                        |
| No.11 | Bendi Park & Waduk Ulujami | Long                   | 3                        |
| No.12 | Ragunan Land               | Long                   | 3                        |
| No.13 | Waduk Kp. Dukuh            | Long                   | 4                        |
| No.14 | Waduk Ceger RW 05          | Long                   | 4                        |

- Detailed Design for Zone 2,3,4,5,7,8,10 are now done by PDPAL JAYA
- Zone 1 Detailed Design using JICA loan IP-565 are on Tender Process
- Zone 1 Construction & Zone 6 Detailed Design-Construction already on the Blue Book



# DKI JAKARTA ZONE 1



Source: JICA PPP Study Team

WWTP moved to Pluit Ponds

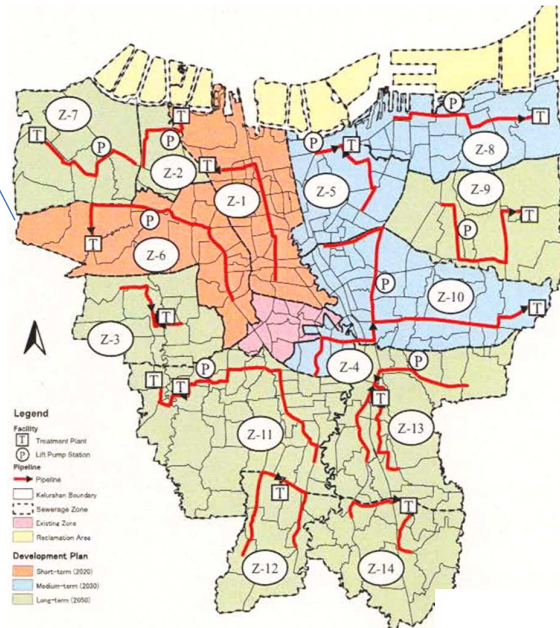


# DKI JAKARTA ZONE 6

WWTP Zona 6 (Duri Kosambi – 6 ha)

Status:

- Pre-Fact Finding Mission for DKI Jakarta Sewerage Zone 6 at 28 Sept – 9 Oct 2015
- WWTP will be located at Duri Kosambi (6 Ha)
- Already Include in *Blue Book 2015-2019*
- *Supplemental Study for Jakarta Sewerage Development Project Zone 6 will be held around September 2016*



Coverage : ± 282.000 m<sup>3</sup>/day  
 Divided into 4 phases:

- Phase 1: 1.183 ha (20%)
- Phase 2: 1.904 ha (32%)
- Phase 3: 1.421 ha (24%)
- Phase 4: 1.367 ha (24%)



# DENPASAR SEWERAGE DEVELOPMENT PROJECT (DSDP)

## (1) Service Area (2008-2014)

DENPASAR, SANUR and KUTA

Coverage Area:

**DSDP- I: 1,145 ha**

**DSDP- II: 971 (815) ha**

**DSDP-III: 2,013 ha**

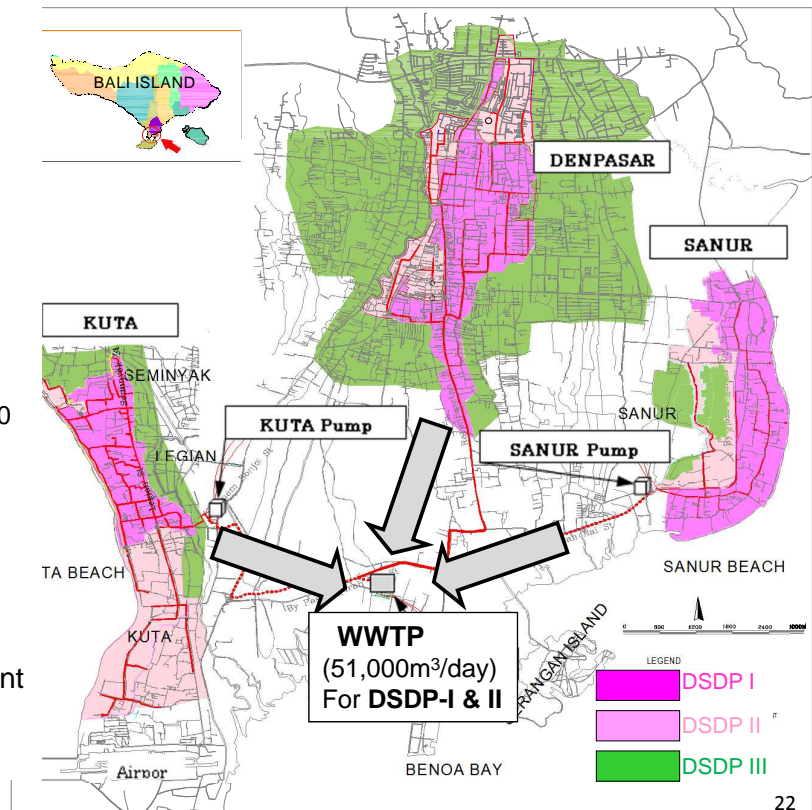
**Total : 4,129 ha (Overall)**

## (2) Service Area Expansion:

- Before : 4,129 ha (Overall)
- After : 7,098 ha (Overall)
- Design population: Approx. 327,000 person
- Design Upgraded WWTP: Approx. 81,000 m<sup>3</sup>/day

## (3) DSDP-III: Already in Blue Book 2015-2019

## (4) Detail Design for WWTP and urgent area DSDP III will be finished on May 2016



ありがとうございます  
(Arigatou gozaimasu)

THANK YOU