



**ENGINEERING DEPARTMENT
(WATER & SANITATION)**

Activities for Sustainable Development of Water Supply in Yangon City

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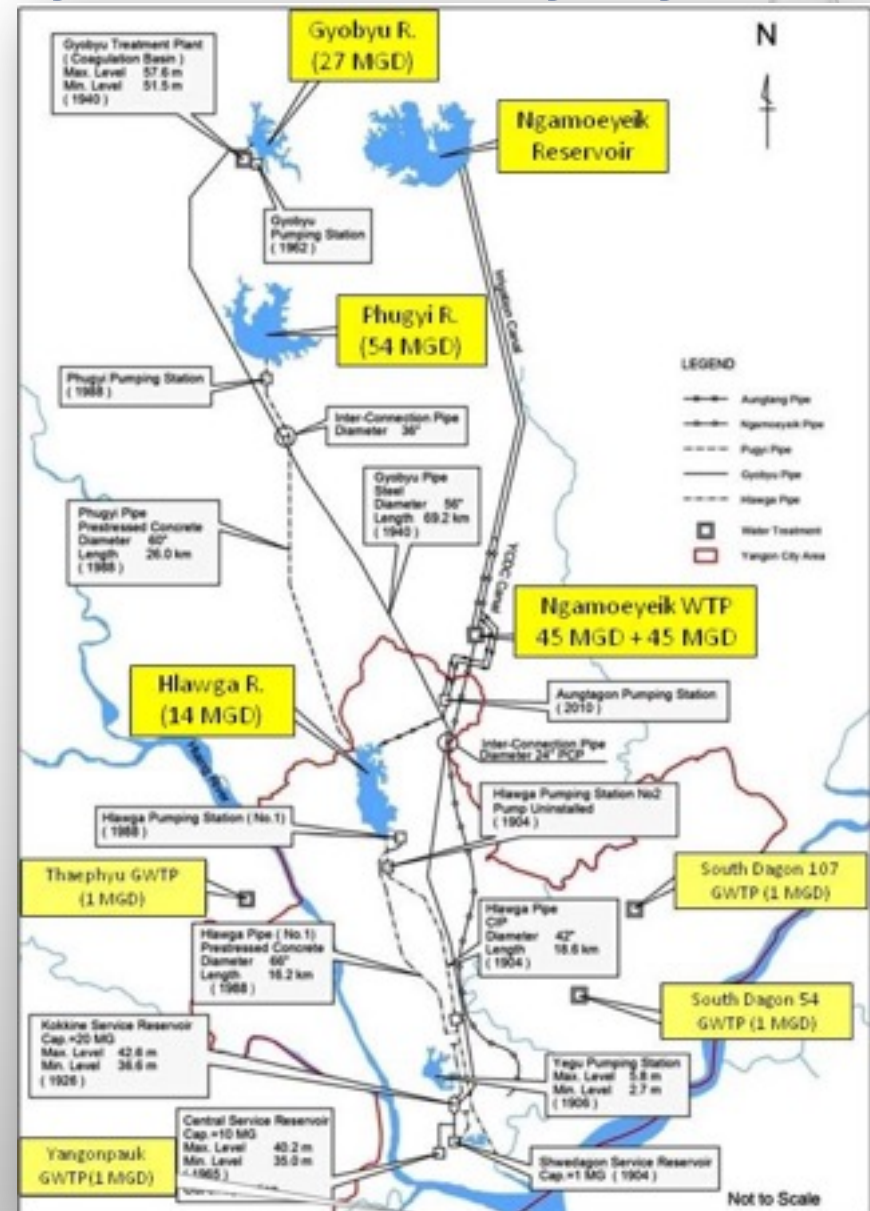
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1. Status of Water Supply System of Yangon

State-of-the-earth of Yangon City Water Supply System

Gyobyu Reservoir	27 MGD (122,727 m ³ /day)
Phugyi Reservoir	54 MGD (245,454 m ³ /day)
Hlawga Reservoir	14 MGD (63,637 m ³ /day)
Ngamoeyeik WTP (1 st phase)	45 MGD (204,545 m ³ /day)
Ngamoeyeik WTP (2 nd phase)	45 MGD (204,545 m ³ /day)
YCDC Tube Wells (425 nos.)	16 MGD (72,727 m ³ /day)
Total Water Supply Capacity	201 MGD(913,635 m³/day)
Main Water Sources	Surface water (92%) Groundwater (8%)
Demand coverage	approx. 40 %
Non-revenue water	approx. 50 %
Total Population	5,209,541 (2014 Census data)
Served Population	~ 2,000,000 (July 2015 field survey data)



1. Status of Water Supply System of Yangon

Four Main Water Reservoirs

Hlawga Reservoir



Phugyi Reservoir



Gyobyu Reservoir



Ngamoeyek Reservoir



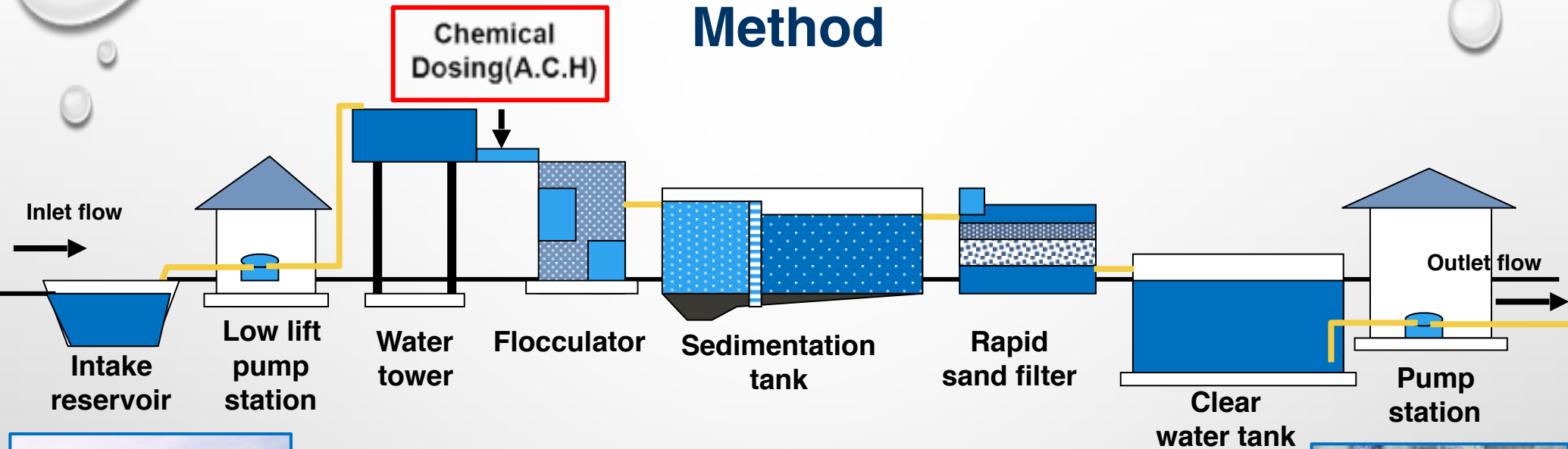
1. Status of Water Supply System of Yangon Ngamoeyeik Water Treatment Plant

Total Capacity – 90 MGD

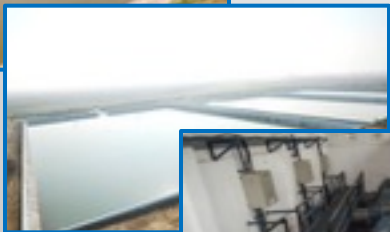


1. Status of Water Supply System of Yangon

Surface Water Treatment using Rapid Sand Filtration Method



Open channel



Intake reservoir



Low lift pumps



Low Lift Pump Station & Water tower



Flocculators & Sedimentation tank



Rapid sand filter



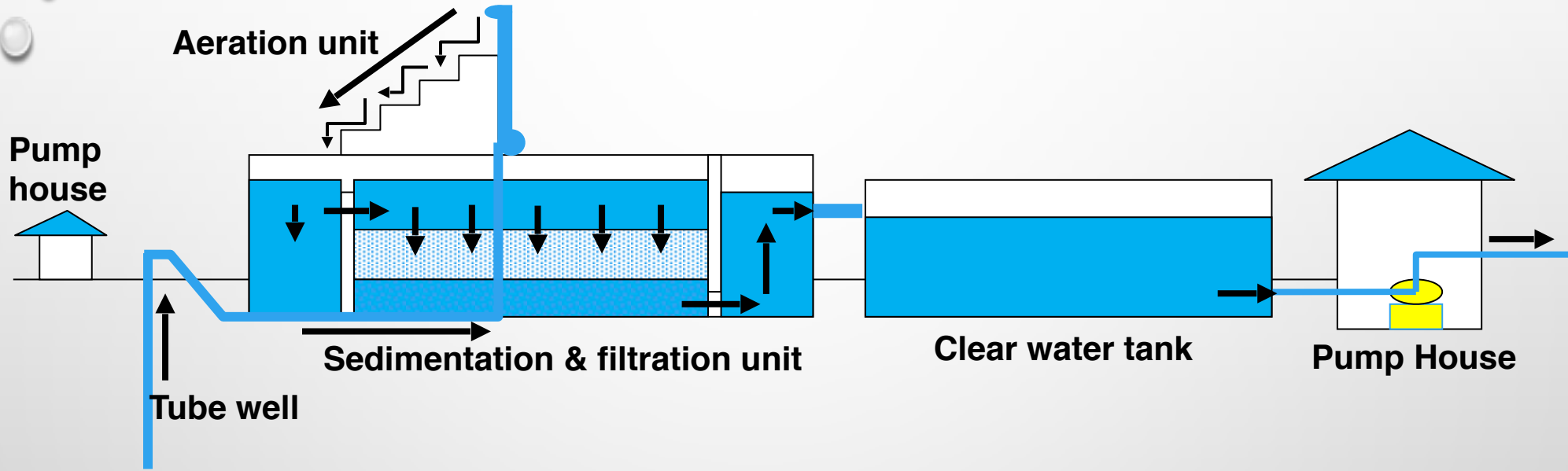
Clear water tank



Pump station

1. Status of Water Supply System of Yangon

Ground Water Treatment Using Aeration Method



Pump House & Tube well



Aeration Cascade



Sedimentation & Filtration



Clear water tank



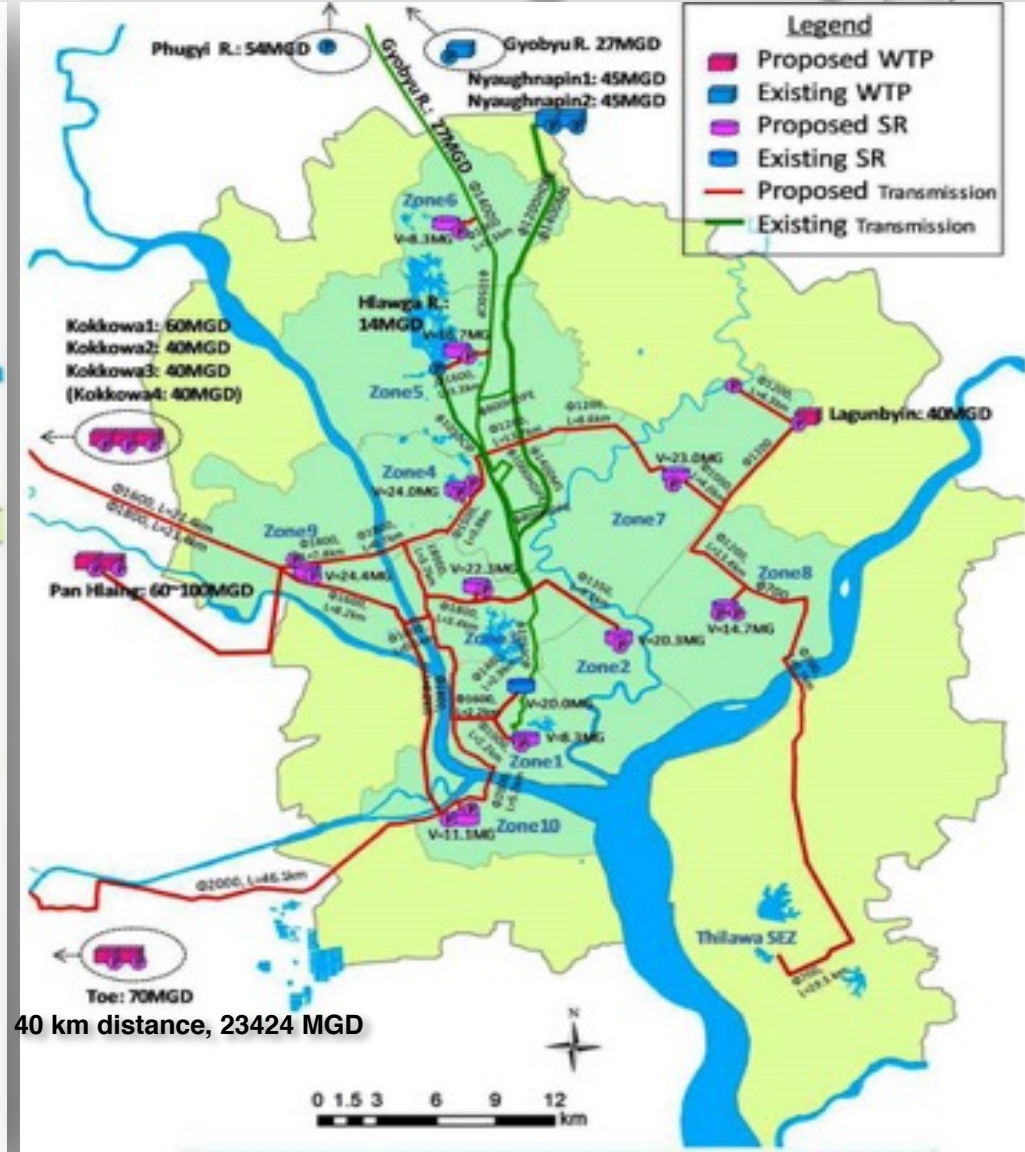
Pump House

2. Development Plan and Activities

Future Water Supply Plan for Yangon City



Water Supply System for 2025



Water Supply System for 2040

2. Development Plan and Activities

Future Service Level Targets in Yangon City Water Supply System

Performance Indicators (PIs)	Target Year						
	2013	2018	2020	2025	2030	2035	2040
Demand coverage (%)	35	45	50	60	65	70	80
Served population (million)	1.8	2.55	2.98	4.05	4.96	6.04	7.82
Non-revenue water (%)	66	51	46	35	26	20	15
Leakage rate (%)	50	37	33	25	18	13	10
Water consumption (gpcd)	30	30	30	35	35	35	40
Avg. Supply Pressure (bar)	0.75	-	-	> 1.5			
Avg. Supply duration (hour)	8hrs.	-	-	24hrs.			
Water quality	Potable	Drinkable					

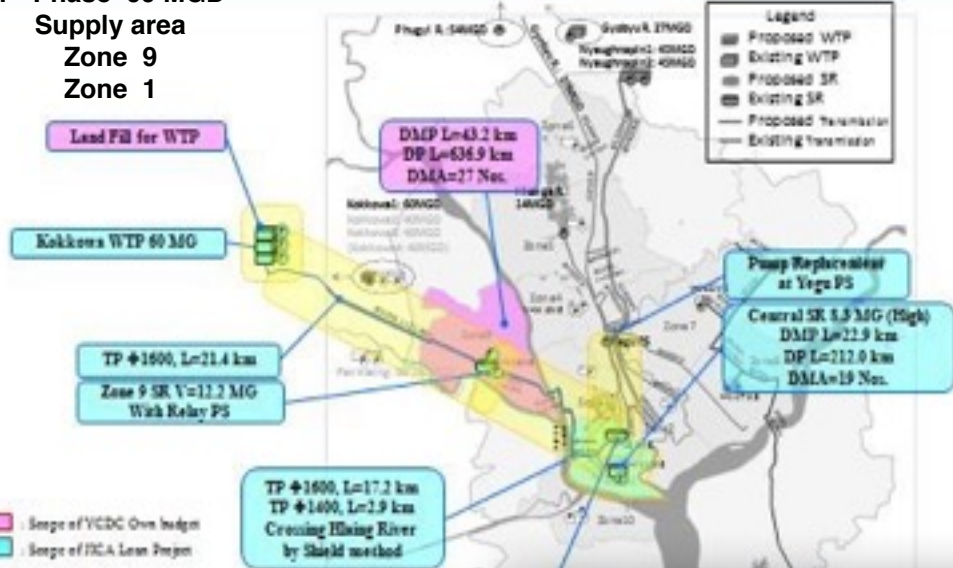
2. Development Plan and Activities

Ongoing Water Supply Projects

Phase 2 Project

Kokkowa Water Supply Project

1st Phase 60 MGD
Supply area
Zone 9
Zone 1



Phase 1 Project

Lagunpyin Water Supply Project



2. Development Plan and Activities

Urgent improvement of Water Supply System in Yangon City

- Pipeline Replacement along Kabaraye Pagoda Road (42"Ø M.S PIPE)
- DMA Pipeline Network Installation for NRW Reduction in Yankin Township



3. Challenges and Current Issues

Challenges Current Issues

Aged Transmission Pipe line

Frequent Pipe Break, Higher Leakage

Complex Distribution Without Zoning System

Unstable Water Pressure, Intermittence water Supply

Higher NRW Rate

FOC connection , Damaged Meter, Spaghetti Service Pipe, Theft

3. Challenges and Current Issues

Challenges and Current Issues

Frequent Pipe Break in Transmission line
Aged Transmission and Distribution Pipe



Spaghetti Pipe

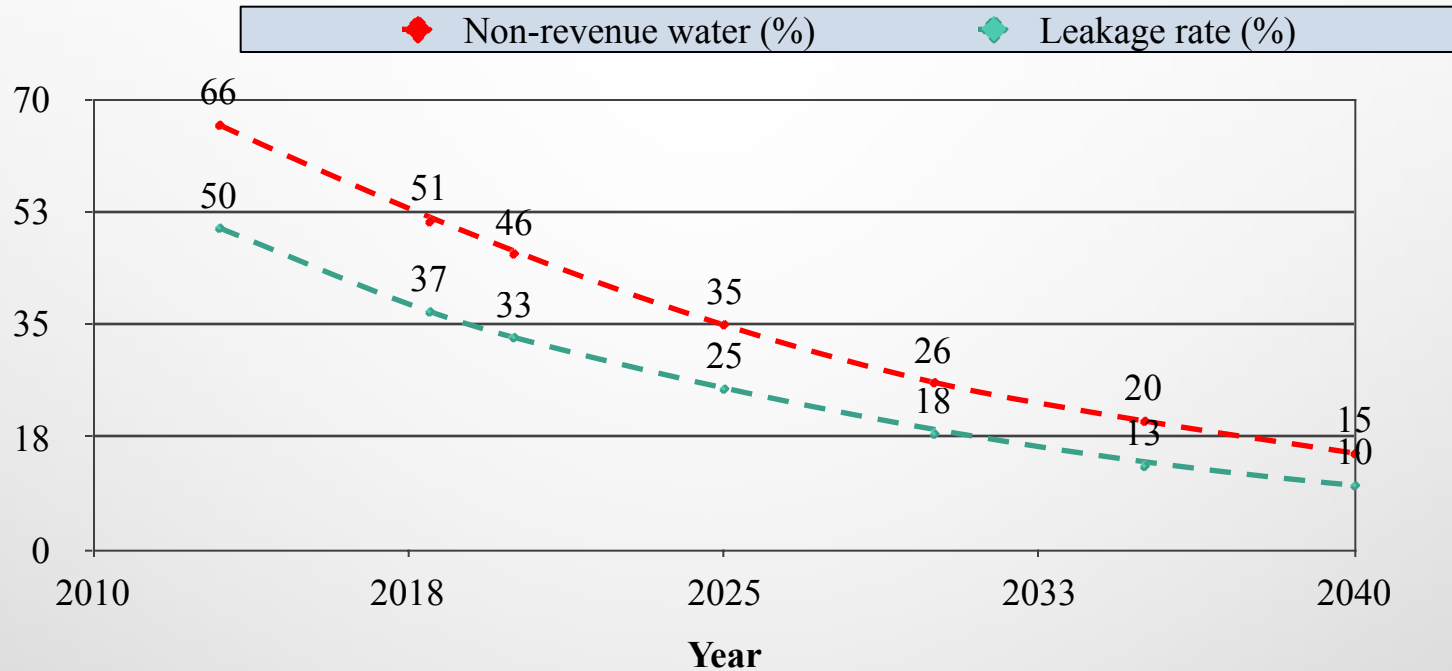


Damaged Water Meter



4. Activities for Non-revenue Water Management

Non-Revenue Water Reduction in Yangon City



Performance Indicators (PIs)	Target Year						
	2013	2018	2020	2025	2030	2035	2040
Non-revenue water (%)	66	51	46	35	26	20	15
Leakage rate (%)	50	37	33	25	18	13	10

4. Activities for Non-revenue Water Management

NRW Reduction Pilot Projects in Yangon City

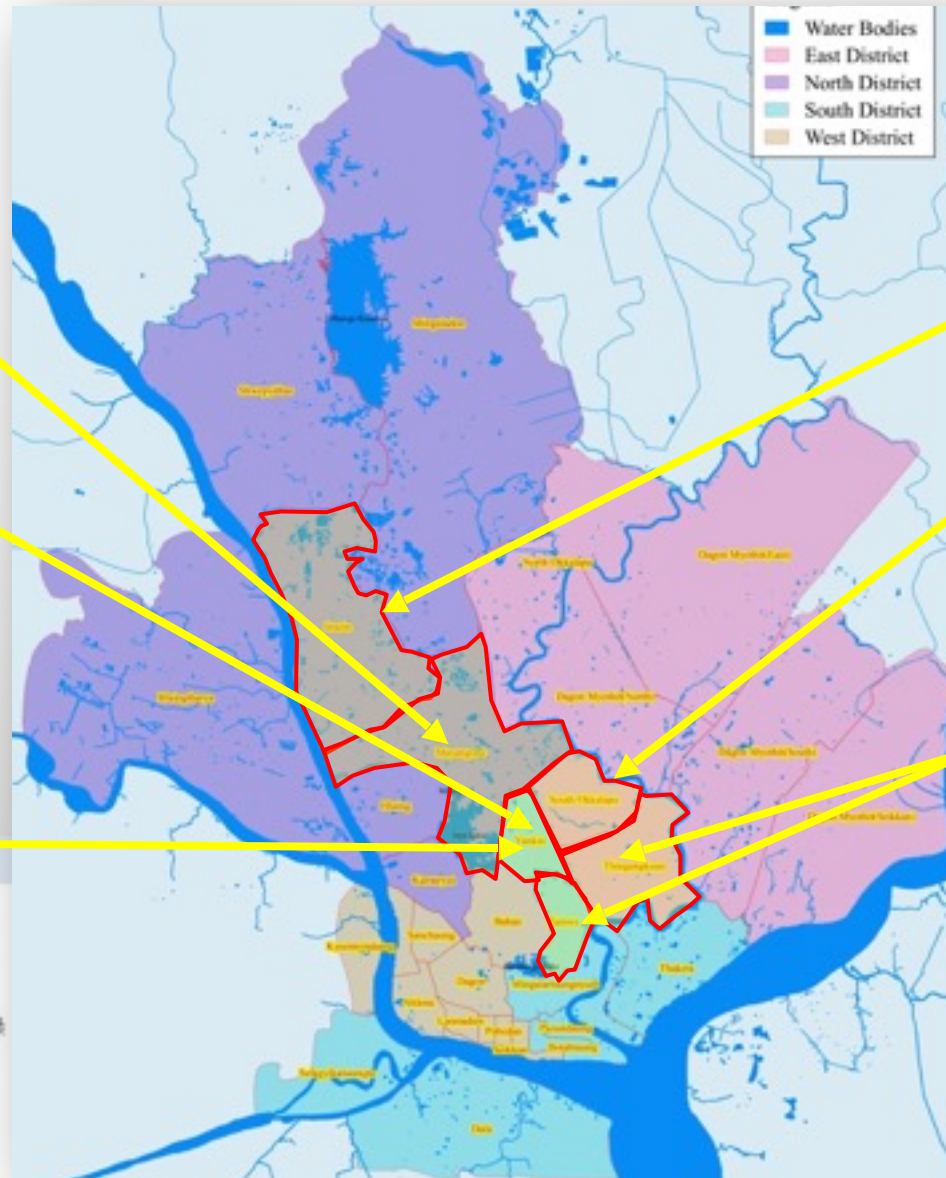
**Mayangone
(Japanese Grant)**



**Yankin
(JICA Expert)**



**Yankin
(JICA Grant Aid)**



**Insein & South Okkalapa
(Manila Water - Mitsubishi)**



**Thingangyun & Tarmwe
(AFD & EGIS, France)**



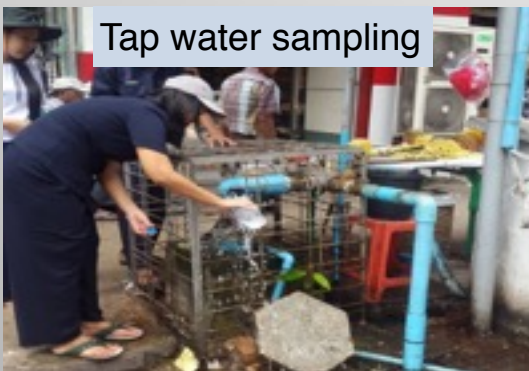
5. Activities for Water Quality Improvement

Water Quality Monitoring

- Monthly Monitoring Rain Water Reservoirs , Tube Wells , Lagunpyin Creek, kokkowa River.
- Quarterly Monitoring Tap Water(Fecal coli form, Total coli form, lead)
- Daily Water Quality Monitoring Surface Water Sources ,WTP, Pumping Station (by Laboratories)



On Site Water Quality Monitoring



Tap water sampling



Residual Chlorine Monitoring



5. Activities for Water Quality Improvement

Main Laboratory-

Established in 2014

(26) parameters can measure

Mini-Laboratories in Reservoirs(2017)

Gyobyu Reservoir

Phugyi Reservoir

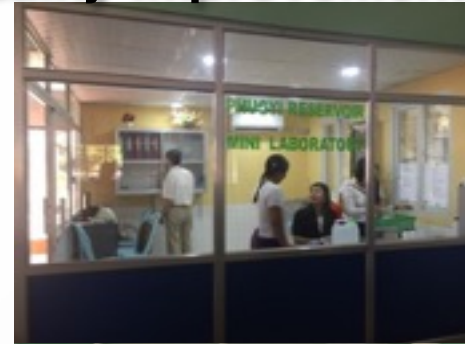
Hlawga Reservoir

Mini-Laboratories in WTP & PS(2017)

Ngamoeyeik WTP

Yegu Pumping Station

Sampling Location	Monitoring item
Gyobyu Reservoir	Daily: Water temperature, pH, Turbidity and Color
	Weekly:TSS (Sampling)
Phugyi Reservoir	Daily: Water temperature, pH, Turbidity and Color
	Weekly:TSS (Sampling)
Hlawga Reservoir	Daily: Water temperature, pH, Turbidity and Color
	Weekly: TSS (Sampling)
	Daily: Water temperature, pH, Turbidity, Color and Residual chlorine*
Yegu PS	*Residual chlorine monitoring is done at After chlorine injection point.
	Weekly:TSS (Sampling)



Capacity building for development of Mini-laboratories



6. Activities for Human Resources Development

Activities for Institutional Management



Activities for NRW Management



Activities for Water Quality Management



7. Activities for Public Relationships

Public Awareness Programs

EDWS
Pamphlets,
Newsletters
&
Desktop
Calendar



8. International Cooperation

Water Supply Improvement Projects with International Organizations

- ODA Loan Project by JICA
- Grant Aid Project by JICA
- Grass Root Grant Project
- Technical Assistant by JICA
- Cooperation with Japan Consortium (TSS, Mitsui & Toyo)
- Cooperation with Manila Water And Mitsubishi co., Ltd.
- Cooperation with AFD And Egis (France)
- Cooperation with Danish Water (Denmark)
- Cooperation with ADB

The background features a light gray gradient with several realistic water droplets of various sizes scattered in the corners. The droplets have highlights and shadows, giving them a three-dimensional appearance.

Thank for your attention!