Yangon's Water Supply Treatment Issues

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Overview of Yangon City Water Supply System

Yangon City Water Supply System

1842 Dug Well (30)

1879 Kandawgyi lake (stop using)

1884 Inya lake (stop using)

1904 Hlawga Reservoir

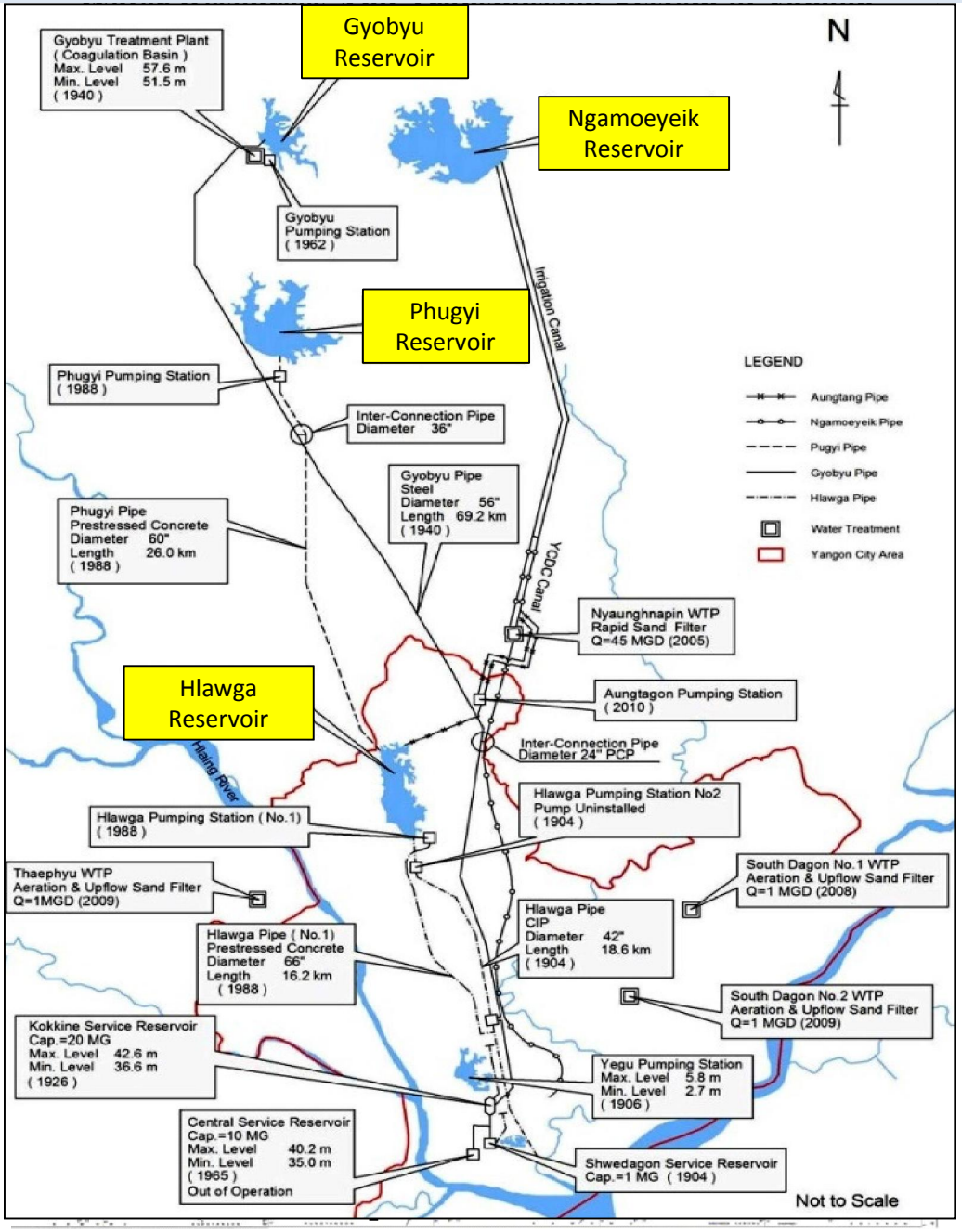
1940 Gyobyu Reservoir

1992 Phugyi Reservoir

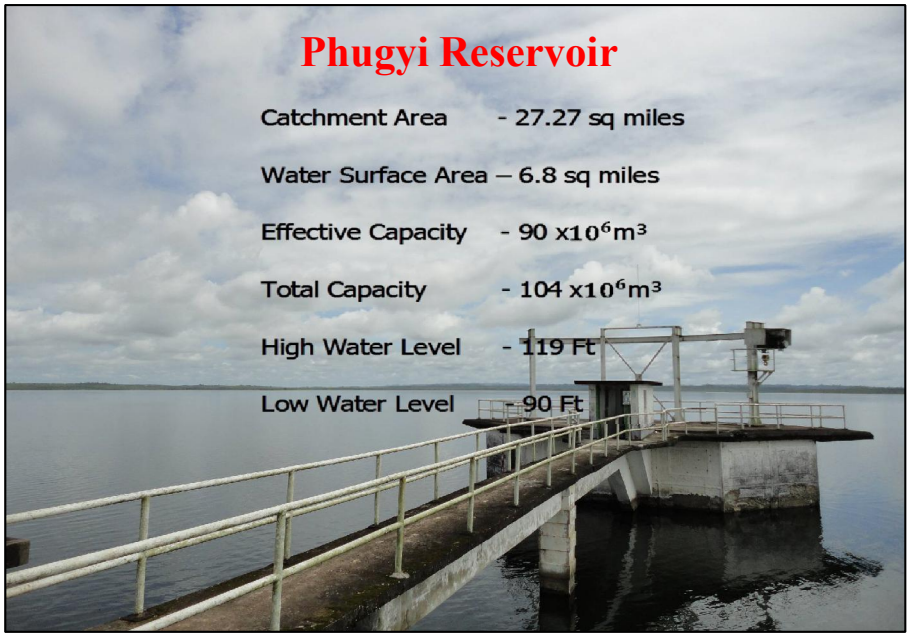
1995 Ngamoeyeik Reservoir

2005 Ngamoeyeik WTP (1st Phase)

2014 Ngamoeyeik WTP (2nd Phase)



Data of Four Main Reservoirs



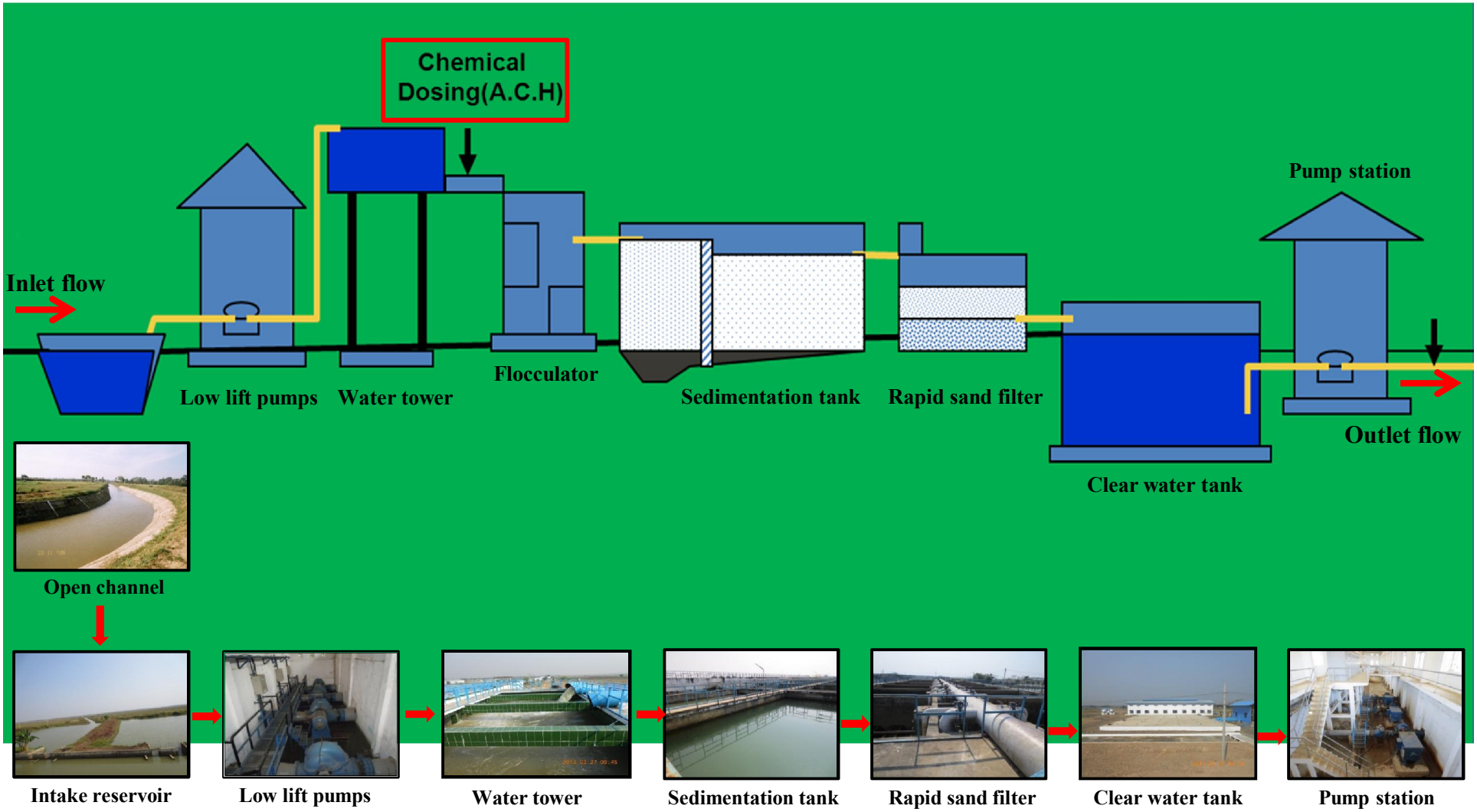
Available Water Resources & Water Supply Amount

- **Surface water** — **Gyobyu, Phugyi, Hlawga, Ngamoeyeik Reservoirs**
- **Ground water** — **442 Tube Wells operated by YCDC**
- **Lakes and ponds** — **Existing 261 nos., used 108 nos. in 12 townships**

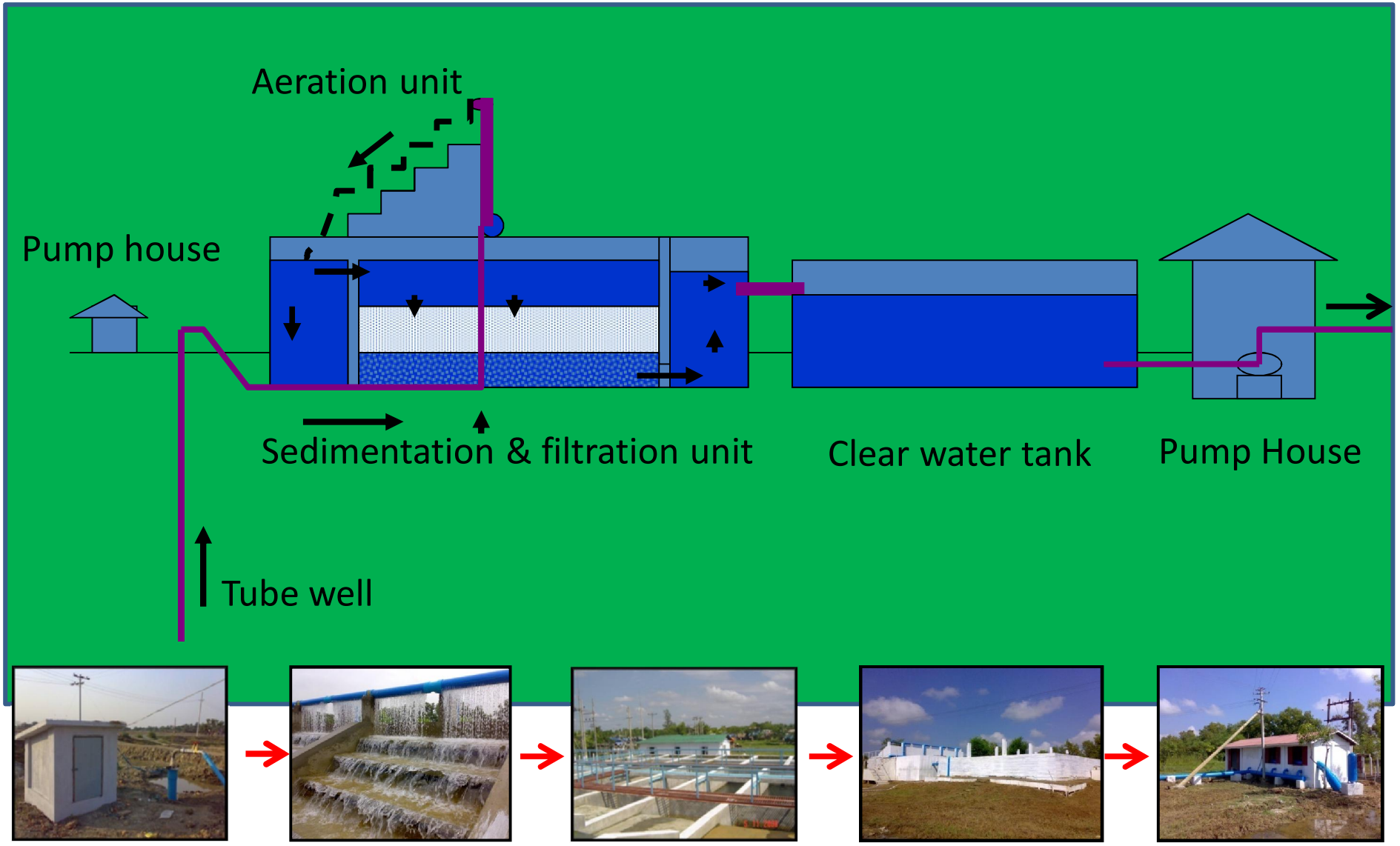
Daily Water Supply Amounts in Yangon City

Gyobyu Reservoir	**- 27 MGD (122727 m^3/day)**
Phugyi Reservoir	**- 54 MGD (245454 m^3/day)**
Hlawga Reservoir	**- 14 MGD (63637 m^3/day)**
Ngamoeyeik Reservoir (1st Phase)	**- 45 MGD (204545 m^3/day)**
Ngamoeyeik Reservoir (2nd Phase)	**- 45 MGD (204545 m^3/day)**
Y.C.D.C Owned Tube Wells	**- 20 MGD (90910 m^3/day)**
Total	**205 MGD (931,818 m^3/day)**

Ngamoeyeik Water Treatment Plant



Ground Water Treatment Using Aeration Method



Problems & Challenges

Major problems facing in Yangon City Water Supply System

Technical problems	(1) Low demand coverage (2) High non-revenue water amount (3) Poor treated water quality (4) Ageing water facilities and main pipelines (5) Inappropriate layout of facilities (6) Insufficient O&M facilities
Organizational problems	(1) Lack of planning section (2) Lack of monitoring section (3) Lack of O&M and management (4) Poor awareness for customer services (5) Poor water quality monitoring system (6) Poor human resources development in the organization
Institutional problems	(1) Standards for installation of service connections (2) Standards for water meter (3) Standards for installation of individual storage tank (4) Standards for installation of individual pumping facilities (5) Inspection of installation works for service pipe
Financial Management problems	(1) Cheap water price (2) Water pricing system (3) Need for introducing corporate accounting system (4) Budget with little freedom (5) Computerization in limited services

Major Challenges

1. Aged pipe lines (>100 year) and pumping stations
2. Direct injection of groundwater into the surface water distribution network at low pressure area
3. Unadequate and unequalized water pressure
4. Higher population growth
5. Rapid expansion of new satellite townships
6. Industrial and commercial development
7. Increasing water demand
8. Customer complaints for both water quality & quantity
9. High NRW %

Group’s Proposal

Group's Proposal

- Capacity building for O & M of water treatment process and water quality monitoring
- Rehabilitation the existing water treatment processes such as post chlorination facilities, disinfection facilities
- Implementing continuous water quality monitoring system, for example, Supervisory Control and Data Acquisition (SCADA) system
- Introducing the new sustainable water resources for ceasing the underground water consumption

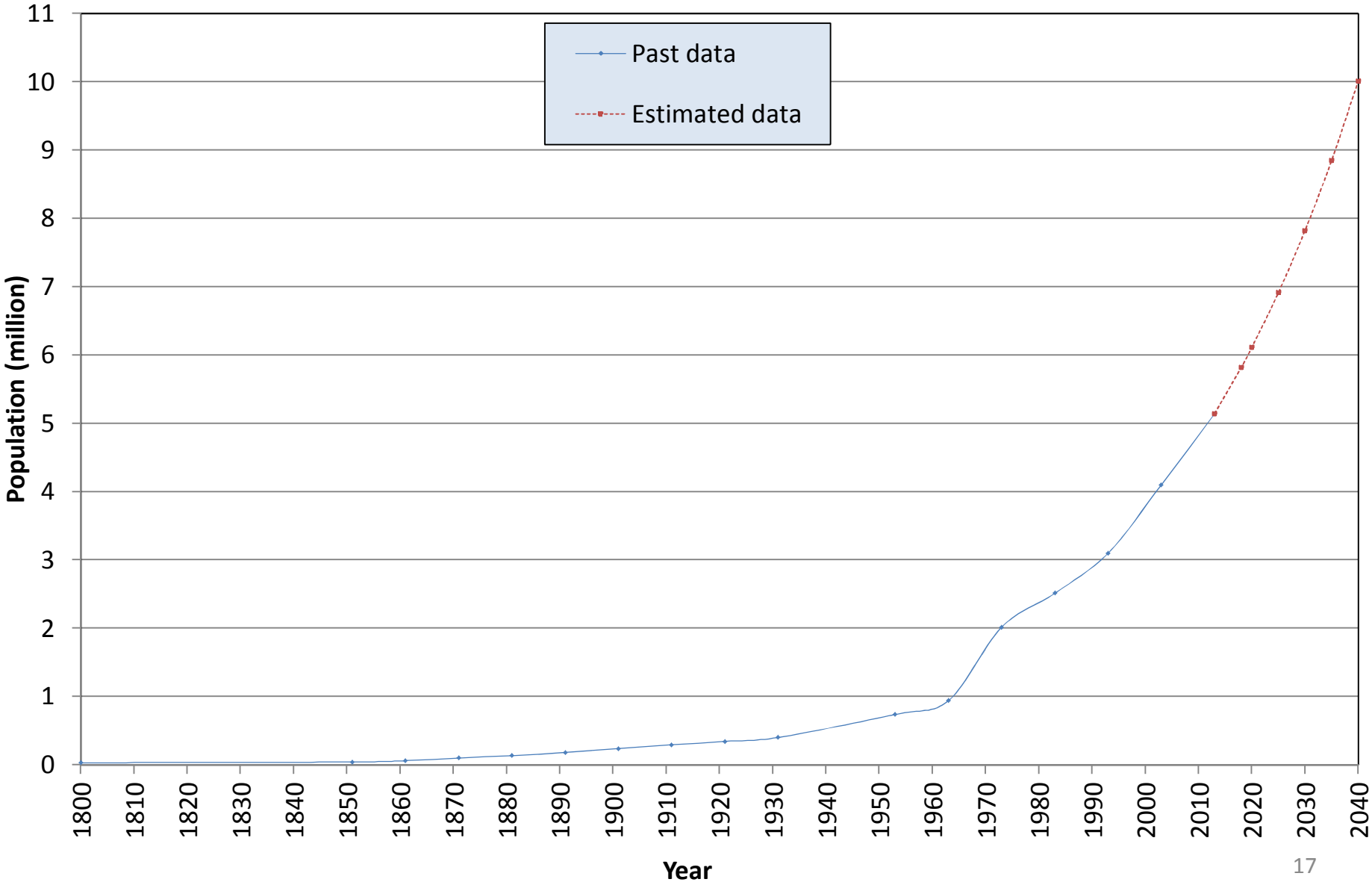
Cooperate Request

Cooperation Request

- Capacity building for engineers and staffs form our departments with the help of international organizations concerning about the treatment technologies, advanced methods and techniques

THANK YOU FOR YOUR ATTENTION

Past and Future Population Trend of Yangon City (1800-2040)



Yangon City Water Supply System

Supply Sources

Hlawga Reservoir (1904)	14MGD
Gyobyu Reservoir (1940)	27MGD
Phugyi Reservoir (1992)	54MGD
Ngamoeyeik Reservoir (2005)	45MGD (1st Phase)
Groundwater sources	20MGD
Total supply capacity (2013)	**160MGD**

Demand Site (Yangon City)

Population	5.14 million (2013)
Daily water use	30 gpcd (imp. gallons/cap/day)
Daily water demand	**154MGD**
Connections	269,268 connections (2013)
90%(domestic), 8%(commercial), 1% (departmental), 1%(FOC)	
Demand coverage	approx. 30% (2013)
Non-revenue water	approx. 66% (2013)
Pricing System	Fixed price per unit
Water Price	0.11 USD per m^3 (commercial) 0.08 USD per m^3 (domestic)

Service level target of YCWSS

Performance Indicators	Target Year		
	2013	**2025**	**2040**
Non-revenue water (%)	**66**	**35**	**15**
Leakage rate (%)	50	25	10
Demand coverage (%)	**35**	**60**	**80**
Water consumption (gpcd)	**30**	**35**	**40**
Supply Pressure (bar)	0.75	> 1.5	
Supply duration (hour)	8hrs.	24hrs.	
Water quality	Non-drinkable	Drinkable	

Ongoing and Proposed Future Projects of YCWSS

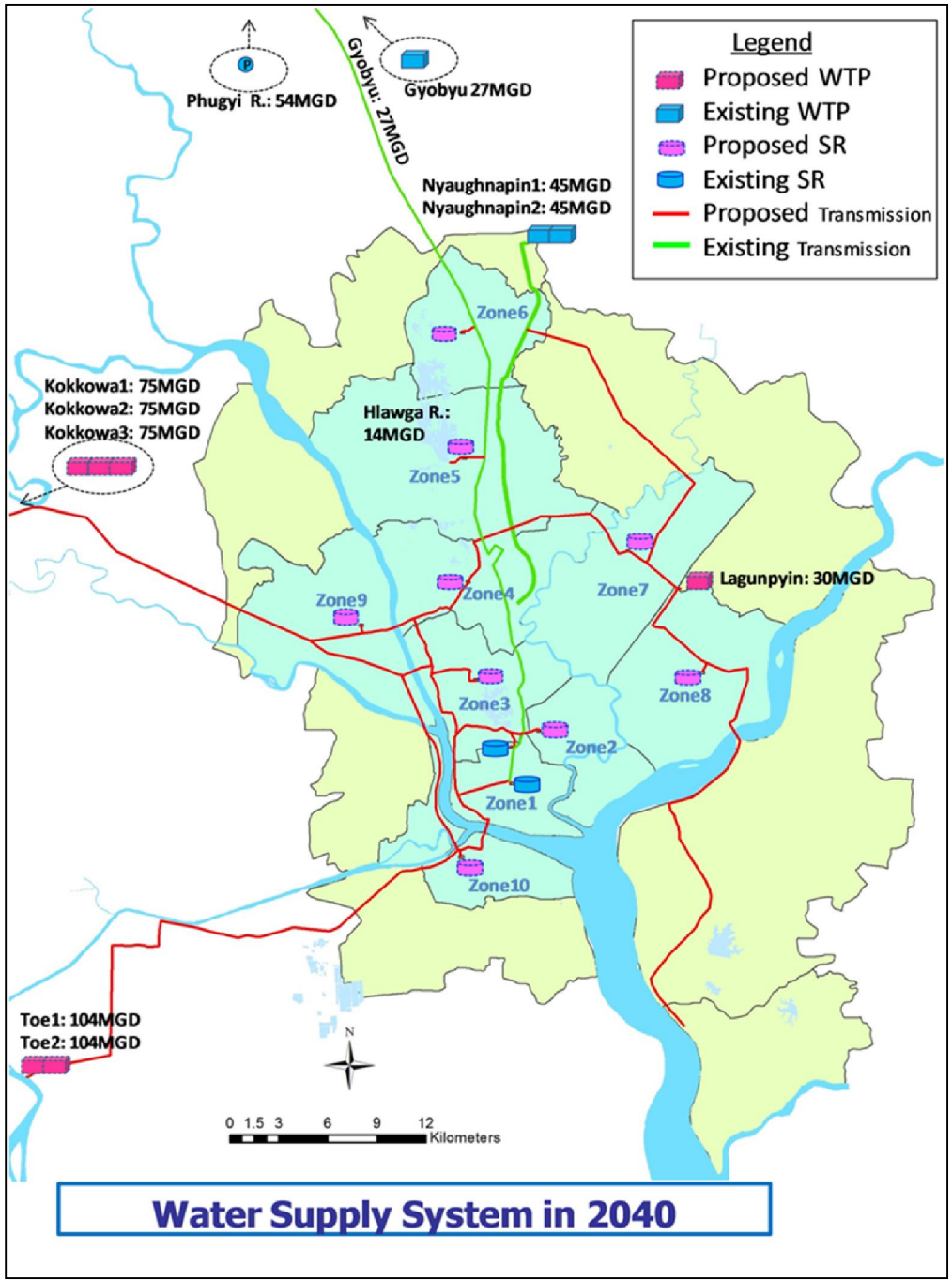
Project	Supply capacity & Start-up year
Ngamoeyeik 2nd Phase	45MGD ('14)
Lagunpyin Reservoir	40MGD ('15)
Kokkowa River (240MGD)	15MGD ('20) + 45 MGD ('25) + 60MGD ('30) + 120MGD ('40)
Toe River (180MGD)	15MGD ('25) + 15MGD ('30) + 30MGD ('35) + 120MGD ('40)

River Source:

1. Kokkowa River
2. Toe River

WTP:

1. Gyobyu
2. Nyaughnapin 1 & 2
3. Lagunpyin
4. Kokkowa
5. Toe

Ground water:

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