

CV of U Khin Maung Win

Name : **U Khin Maung Win** DOB : 15 January 1958

Education : B.Sc. (Industrial Chemistry) (YU) in 1979

B.E. (Chemical Engineering) (YTU) in 1982

M. Eng. (Environmental) (AIT) in 1989 ;

PE (Chemical) (0414) ; ACPE (Asean Chapter Professional Engineer) ; ASEAN Engr:

Position : ~ Patron & Executive Consultant

Myanmar Water Engineering & Products Co., Ltd. (MWEP)

~ Consultant

Drainage & Wastewater Management Authority

Yangon City Development Committee (YCDC)

~ Executive Consultant

Myanmar Wellthy Aqua Solution Co., Ltd. (MWAS)

~ Central Committee

Myanmar International Consulting Engineers Group (MICEG)

~ Visiting Professor

* Civil Engineering Department; Yangon Technological University. (YTU)

**Chemical Engineering Department; Yangon Technological University. (YTU)

~ Supervisor & External Examiner for M.Sc. & Ph.D. candidates

Department of Industrial Chemistry; Yangon University. (YU)

- Experience** : ~One of Entrepreneur in Water and Wastewater Engineering field in Myanmar and over 25 years experience in Water and Wastewater Engineering Business since 1994.
- ~ Contribution of field experience in teaching, research and development as Visiting Professor in Yangon Technological University (YTU) and Yangon University (YU) since 1996.
 - ~ Conducts as Consultant for Government Institution, Company, NGO and Private Sectors.
 - ~ International cooperation as National Consultant with UNDIIO, Smart Myanmar, GIZ, WWF, H&M Group, Rotary Club and Responsible Business Fund (RBF)
 - ~ Business and Project cooperation with International Company such as Joint Venture with Mitsubishi Chemical Aqua Solution to introduce the Membrane Technology and Projects Implementation with Hitachi Zosen Corporation.
 - ~ Introduce the Environmental Management System program and vocational training program for industrial and private sectors.

- **Part (1) Water Supply & Wastewater Management in Myanmar**

- **Part (2) Activity of Myanmar Water Engineering & Products Co., Ltd. on Water & Wastewater Industry in Myanmar**

- **Part (3) National Water Supply & Wastewater Management Projects in Myanmar**

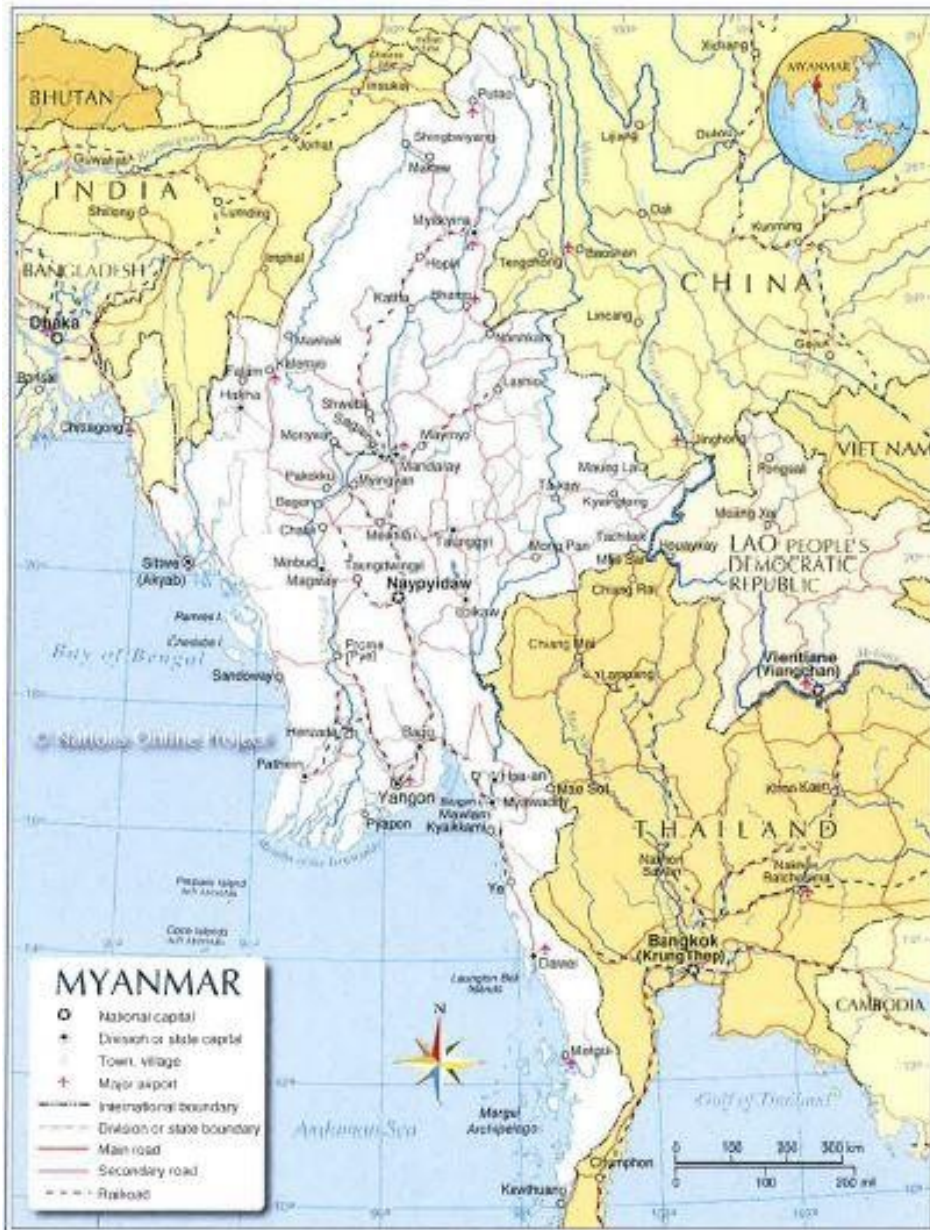
Part (1)

Water Supply & Wastewater Management in Myanmar

**MYANMAR WATER
ENGINEERING AND PRODUCTS CO.,LTD**



Geography (Myanmar)



- Myanmar, the second largest country in Southeast Asia
- Its characteristics: Mountain ranges in East and West, Long costal strip in South
- Area 676,553 Square Kilometers
- Population 52 Millions people
- 7 States and 7 Divisions comprising with 63 districts for administrations

MYANMAR WATER

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Project Rationale and Linkage to Country / Regional Strategy

Although 70% of Myanmar's population resides in rural areas, the urban population has grown 2.3% per year, faster than the country's total population (1.8% per year). The urban population in Myanmar increased from 14.6 million or 29% of the total population in 2000 to 18.4 million or 31% of the total population in 2010. Currently, 10% of Myanmar's population lives in two major cities, Yangon and Mandalay, contributing to 30% of gross domestic product (GDP), and this share is expected to rise rapidly. It is estimated that by 2030, 25% of Myanmar's population will live in urban areas, accounting for roughly 50% of

Myanmar's **GDP above 6** once ongoing and planned tax reform in Myanmar result in a functioning tax regime, the majority of tax revenue will also likely come from cities. However, to ensure that urbanization will be a driving force for economic growth and social development, urban planning and management need to be modernized and investments in urban infrastructure need to be increased.

Myanmar Sustainable Development Plan (2018 – 2030)

The Myanmar Sustainable Development Plan (MSDP) is the expression of our national development vision – a vision that finds resonance in the global sustainable development agenda.

Genuine development will only come to Myanmar if, and only if, all these plans move harmoniously and coherently under the aegis of a single national strategy. The MSDP delivers this strategy, providing an overall framework for coordination and cooperation across all ministries, and all States and Regions to forge a common path towards the emergence of a prosperous, peaceful and democratic Myanmar. The Myanmar Sustainable Development Plan (MSDP) provides a long-term vision; a vision of a peaceful, prosperous and democratic country.

A Peaceful, Prosperous & Democratic Myanmar

Goal 1: Peace, National Reconciliation, Security & Good Governance

Goal 2: Economic Stability & Strengthened Macroeconomic Management

Goal 3: Job Creation & Private Sector Led Growth

Goal 4: Human Resources & Social Development for a 21st Century Society

Goal 5: Natural Resources & the Environment for Posterity of the Nation

Law Enforcement in Myanmar

Economy

- ✓ Foreign Investment Law (2012)
- ✓ Special Economic Zone Law (2014)
- ✓ Arbitration Law (2016)
- ✓ Public Procurement Law (2018)
- ✓ Myanmar Sustainable Development Plan (MSDP) (2018 – 2030)

Public-Private Partnership (PPP) Law (Draft in 2016)

Environment

- ✓ Environmental Conservation Law (2012)
- ✓ Environmental Conservation Rule (2014)
- ✓ Myanmar Environmental Impact Assessment Procedure (2015)
- ✓ Myanmar Environmental Quality Emission Guidelines (M-EQEG) (2015)

For more infos,

[https://themimu.info/sites/themimu.info/files/documents/Core Doc Myanmar Sustainable Development Plan 2018 - 2030 Aug2018.pdf](https://themimu.info/sites/themimu.info/files/documents/Core_Doc_Myanmar_Sustainable_Development_Plan_2018_-_2030_Aug2018.pdf)

(Myanmar Sustainable Development Plan)

<https://pppknowledgelab.org/countries/myanmar> (Myanmar Public Private Partnership)

<http://www.ecd.gov.mm/?q=law>
(Environmental Conservation Law)

MYANMAR WATER

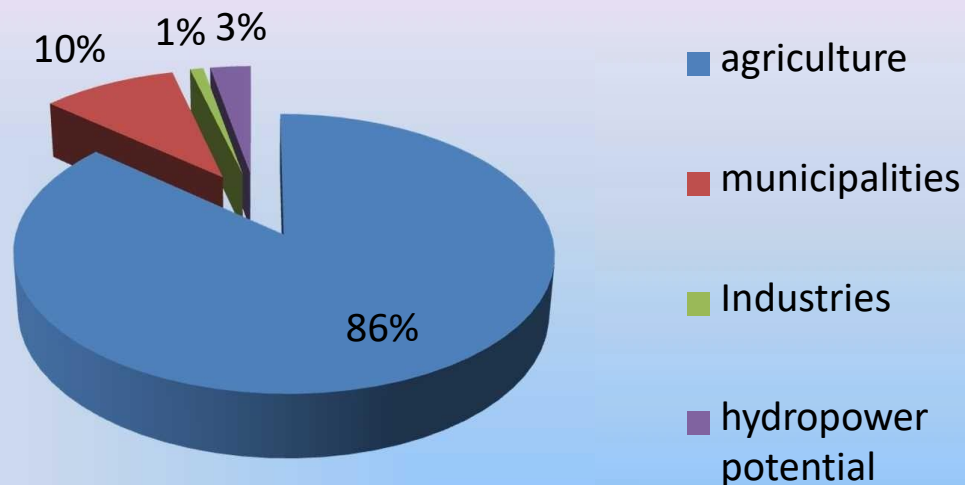
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Improved sanitation facility

	Flush/pour flush to:					Total
	Piped sewer system	Septic tank	Ventilated Improved pit latrine	Pit latrine with slab	Composting toilet	
State/Region						
Kachin	0.0	31.6	5.7	53.9	0.9	92.10
Kayah	0.0	4.8	0.4	74.3	1.7	81.20
Kayin	0.0	2.2	1.2	69.4	0.7	73.50
Chin	0.0	0.3	5.6	76.8	4.2	86.90
Mon	0.0	2.9	12.9	75.0	0.4	91.20
Rakhine	0.0	1.0	1.6	41.6	3.9	48.10
Shan(North)	0.0	16.0	3.6	42.8	6.0	68.40
Shan(East)	0.0	71.0	0.4	20.6	0.1	92.10
Shan(South)	0.3	11.7	5.0	68.1	0.6	85.70
Ayeyarwaddy	0.0	3.7	0.9	77.1	1.4	83.10
Bago(East)	0.2	9.6	0.8	69.3	0.0	79.90
Bago(West)	0.0	0.6	1.3	85.8	0.8	88.50
Magwe	0.0	7.0	4.3	71.5	1.3	84.10
Mandalay	0.0	17.5	8.5	65.0	0.0	91.00
Sagaing	0.0	2.1	1.5	86.8	0.5	90.90
Tanintharyai	0.0	20.7	6.4	55.3	1.9	84.30
Yangon	7.3	38.8	0.9	46.7	0.2	93.90
Area						
Urban	3.6	32.3	4.8	53.5	0.3	94.50
Rural	0.0	6.0	3.1	69.8	1.4	80.30

Sector of Water Usage in Myanmar



- Total water withdrawal is less than 5% of the renewable resource available
- Approximately 91% of the total water withdrawal comes from surface water and 9% from groundwater.
- Groundwater is mostly used for domestic purposes.
- Impact assessments will be needed to ensure that these projects do not compromise other uses, notably for agriculture.

Introduction to Yangon City and YCDC



OUTLINES OF YANGON CITY



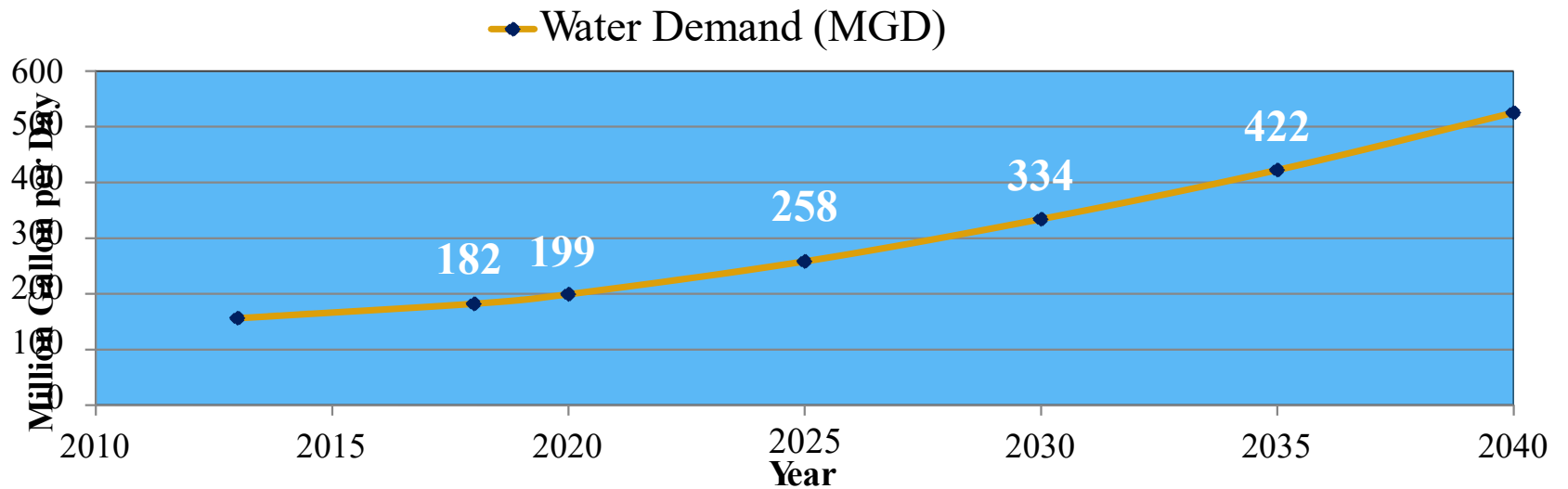
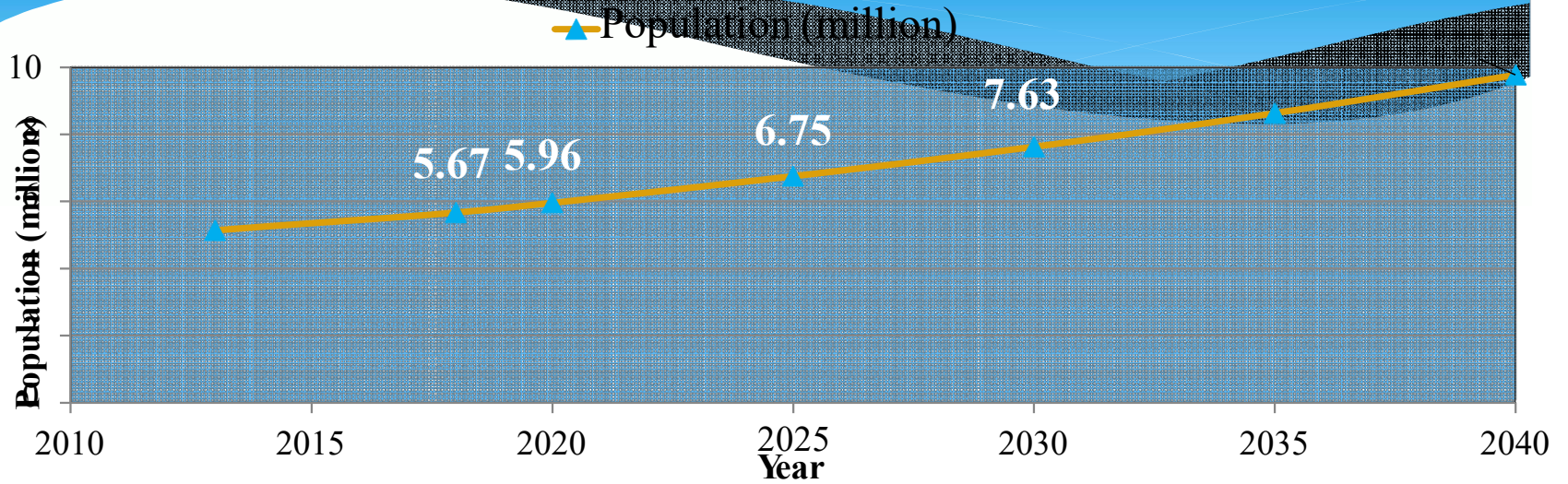
YANGON CITY AREA :	730 Km ²
POPULATION :	About 6 Millions
DISTRICTS :	4 Districts
TOWNSHIPS :	33 Townships
AVERAGE ANNUAL RAINFALL :	2700 mm
MEAN MAX: TEMP: :	33°C
MEAN MIN: TEMP: :	21°C



Introduction to Yangon City and YCDC

- ❖ YCDC (Yangon City Development Committee) has Six major departments and responsibilities for the recreation of the city dwellers, construction and maintenance of roads, bridges, building, playgrounds and parks, water supply works and disposal of solid waste, proper management of sanitation and so on.
- ❖ Water which is being used every day in Yangon is supplied and managed by water and sanitation department under YCDC.

Future population and Water Demand



(Source: JICA-YCDC Master Plan 2014)

Challenges and Current Issues

Frequent Pipe Break in Transmission pipeline

Aged Transmission and Distribution Pipe

Spaghetti Pipe

Damaged Water Meter

High Water Demand

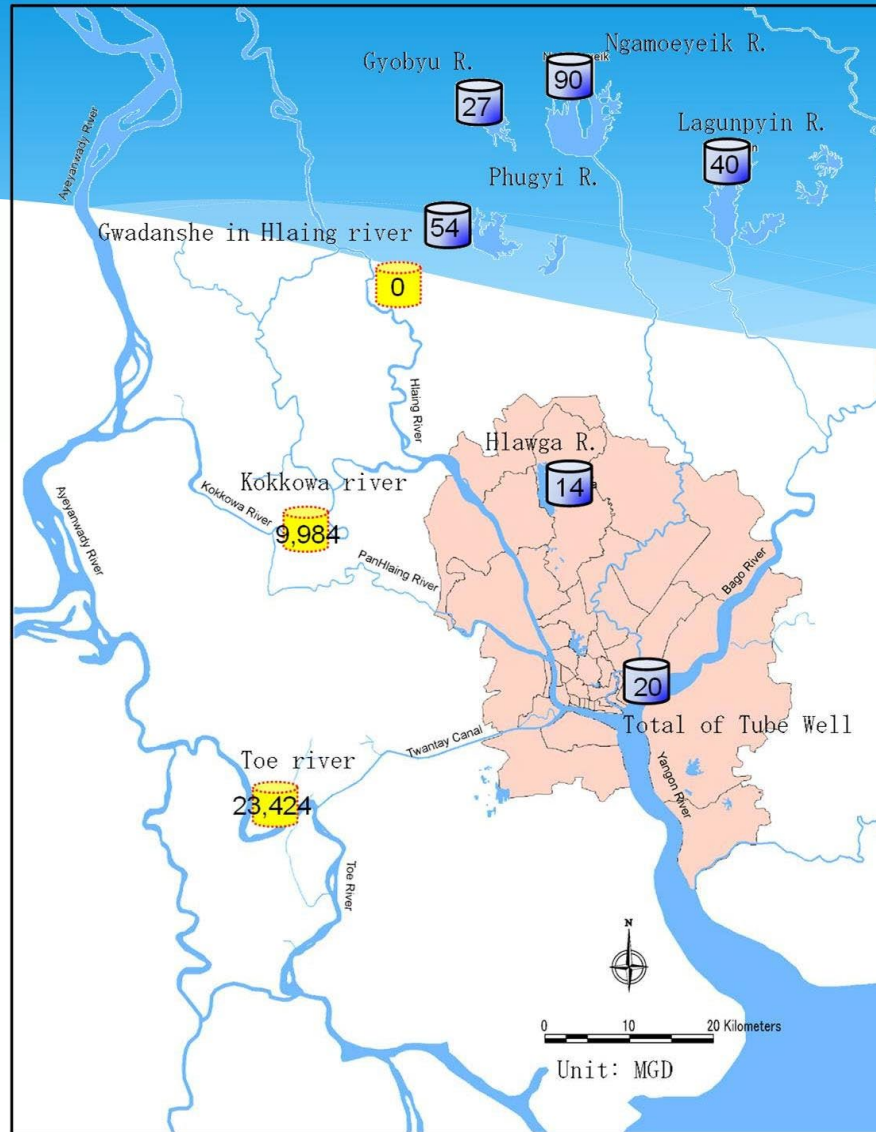
High NRW Rate (~ 60%)



Water Supply Improvement Plan

Zone	Name of Zone	Township & Township Group's
1	Central area	Central Business District (CBD) Inner Urban Ring (IUR)
2	Tarmwe, Thaketa	Tarmwe, Thingangyun, Thaketa
3	Hlaing	Mayangone, Yankin, Hlaing
4	Mayangone	(South) Mingalardon, North Okkalapa, (South) Insein
5	Mingalardon, Shwepyithar	(Center) Mingalardon, (North) Insein, Shwepyithar
6	North side	(North) Mingalardon
7	East side 1	East Dagon, North Dagon
8	East side 2	South Dagon, Dagon Seikkan
9	West side	Hlaingtharyar
10	South side	Dala, Seikkyi-Khanaungto, (W t)

Water Supply Improvement Plan



Preparatory Survey for Greater Yangon Water Supply Improvement Project (Phase II)

River Source:

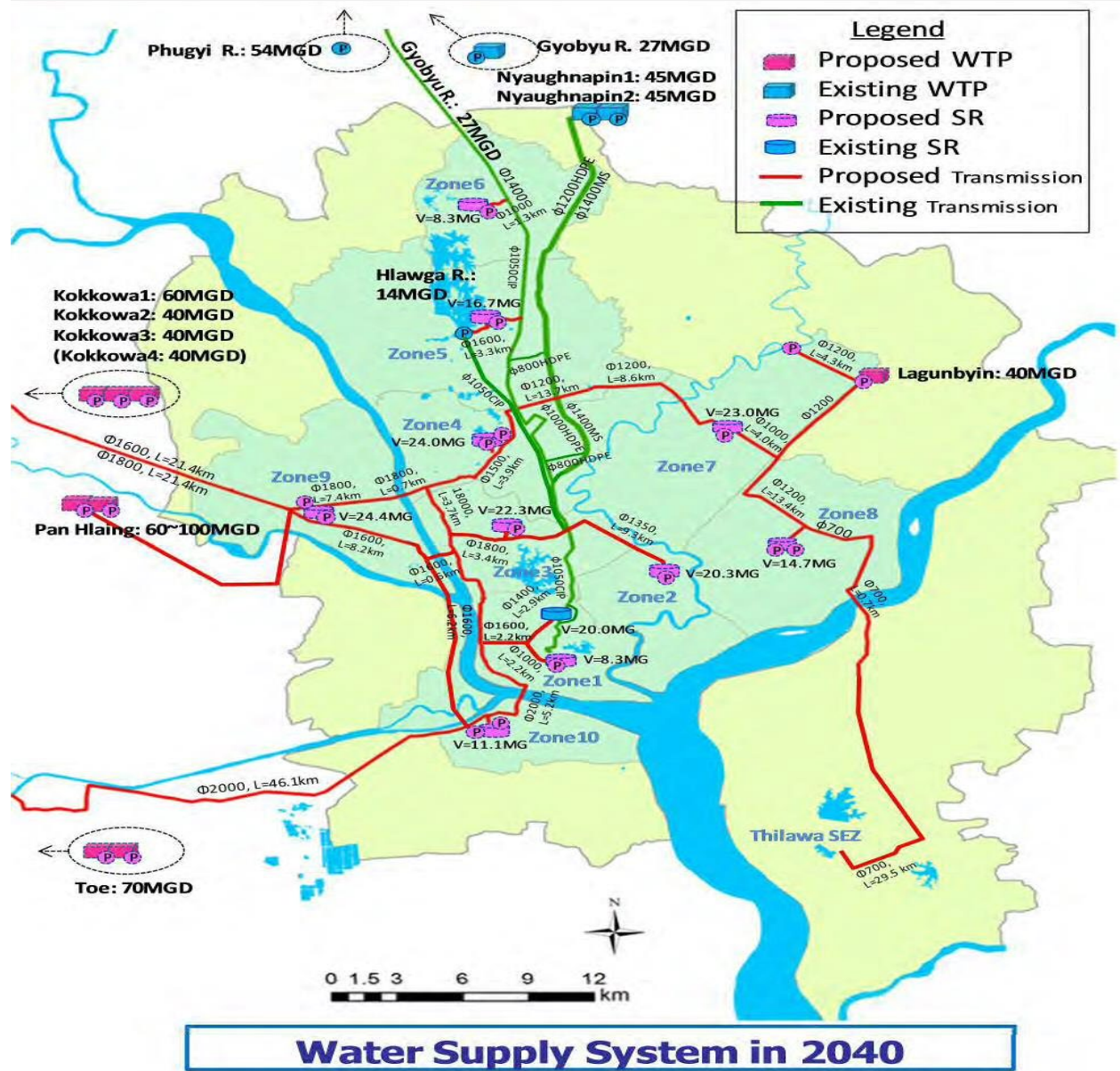
1. Kokkowa River
2. Toe River

WTP:

1. Gyobyu
2. Ngamoeyeik Phase 1 & 2
3. Lagunpyin
4. Kokkowa
5. Toe

Ground water:

0 in 2025



Challenges and Current Issues

Frequent Pipe Break in Transmission pipeline

Aged Transmission and Distribution Pipe

Spaghetti Pipe

Damaged Water Meter

High Water Demand

High NRW Rate (~ 60%)



Development Activities

Insein Township

South Okkalapa Township

DMA Htan Pin Gone NRW Reduction Results

Results Summary

NRW Reduction Action Plans

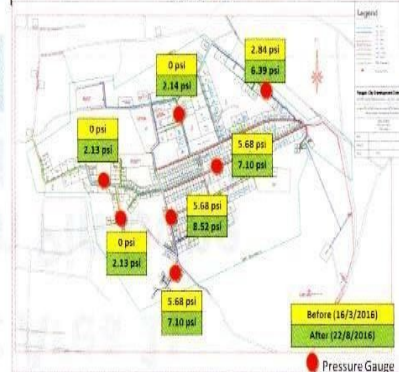
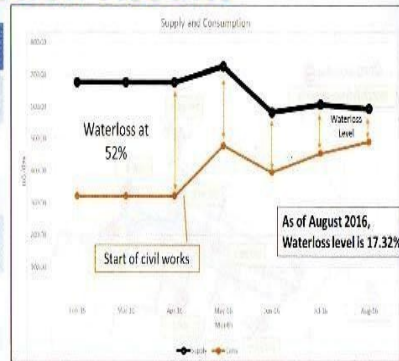
- Customer meter replacement
- Decommissioning of GI pipes, transfer location of tapping, and new pipe laying
- Step-testing, leak detection, and leak repair
- Disconnection of unauthorized connections and Registration of unaccounted connections, and unregistered meters

Final Water Loss Level

17.32%

Pressure Improvement

Increase of 1.87 psi at line meter point (average)
Increase of 2-3.5 psi throughout the DMA (spot check)



DMA Block 14-2 NRW Reduction Results

Results Summary

NRW Reduction Action Plans

- Customer meter replacement and relocation
- Step-testing, leak detection, and leak repair
- Decommissioning of CIP pipes, transfer location of tapping, and new pipe laying
- Disconnection of unauthorized connections and Registration of unaccounted connections, and unregistered meters

Network Improvement Action Plans

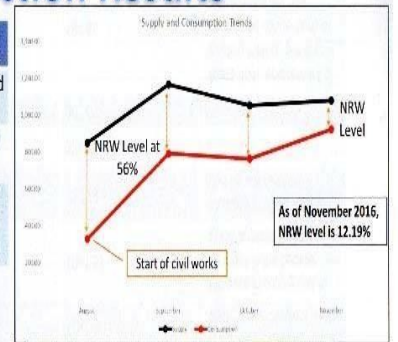
Booster Installation

Final Water Loss Level

12.19%

Pressure Improvement

Increase of 2.16 psi at line meter point (average)
Increase of 1-2psi throughout the DMA (spot check)



Development Activities

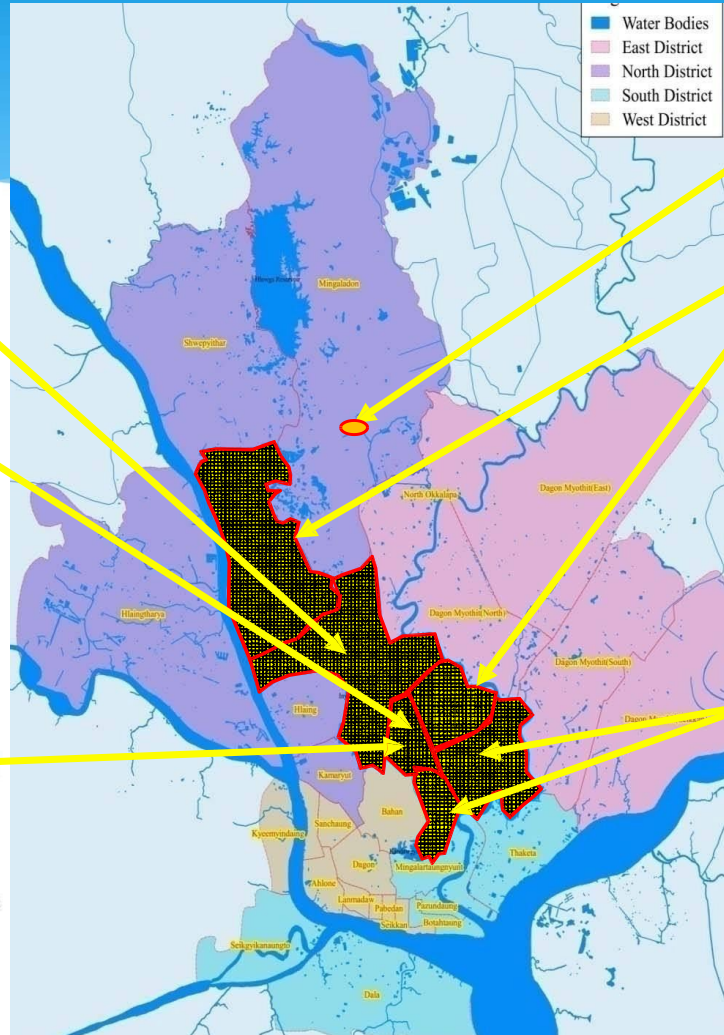
**Mayangone
(Japanese
Grant)**



**Yankin
(JICA Expert)**



**Yankin (JICA
Grant Aid)**



**Nyaungnabin
WTP-1
(JICA Grant
Aid)**

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



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



Development Activities

Future Service Level Targets in Yangon City Water Supply System

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
Demand coverage (%)	35	45	50	60	65	70	80
Served population (million)	1.8	2.6	3.0	4.1	5.1	6.2	8.0
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					

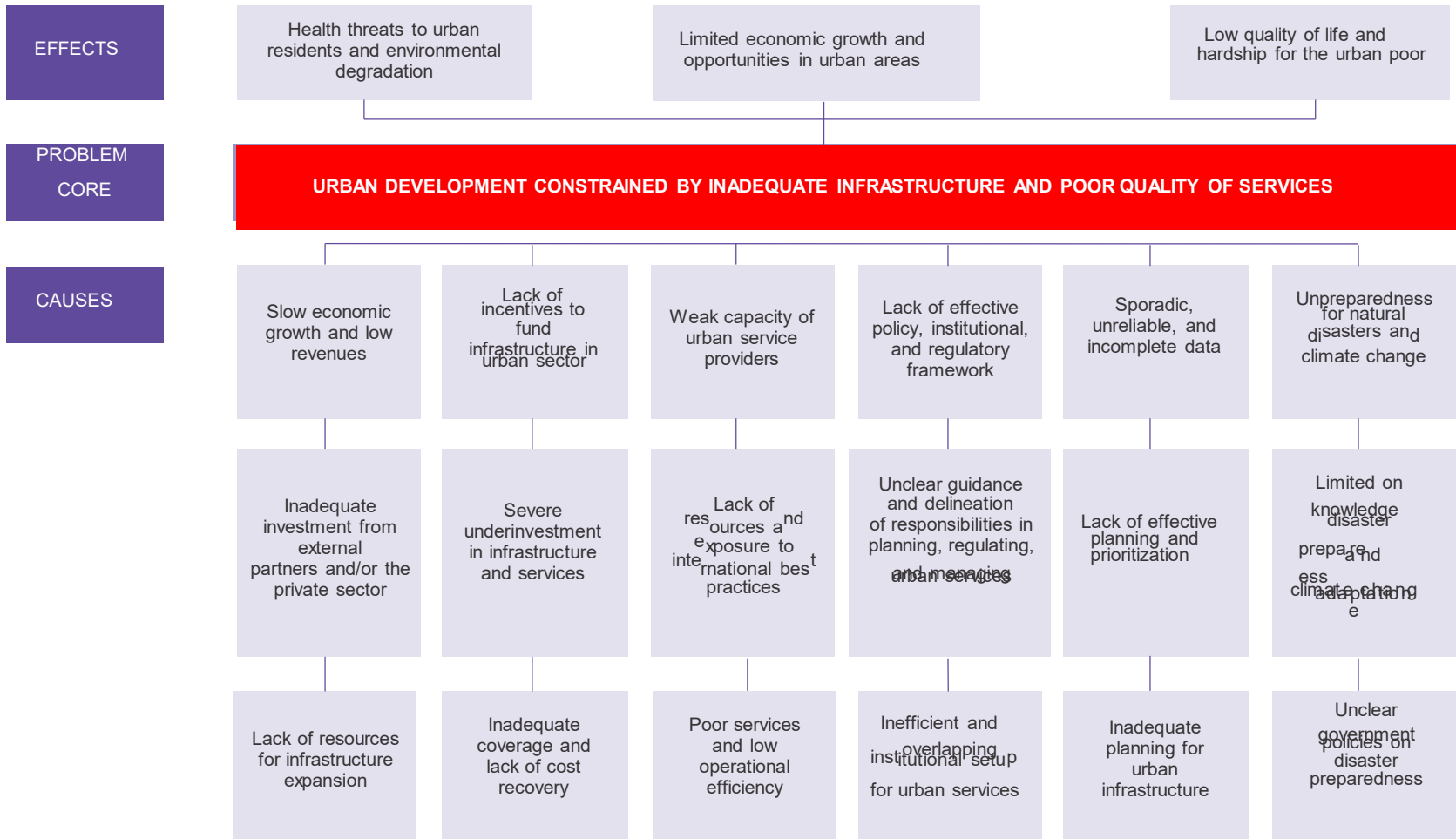
Sector Road Map and Results Framework

Country Sector Outcomes		Country Sector Outputs		ADB Sector Operations	
Outcomes with ADB Contribution	Indicators with Targets and Baselines	Outputs with ADB Contribution	Indicators with Incremental Targets	Planned and Ongoing ADB Interventions	Main Outputs Expected from ADB Interventions
Enhanced capacity of central and local government agencies and urban utilities to plan and deliver good-quality water, sanitation, and solid-waste management infrastructure facilities and services	Proportion of population with sustainable access to improved urban services increased by end of 2016 ^a	Improved provision and maintenance of urban services including water supply, sanitation, and drainage Greater efficiency through capacity development of urban utilities	At least 20% of selected utilities staff, particularly from middle management, trained in various aspects of utility management Capacity of water utilities in planning and managing operations efficiently increased	(i) Planned key activity areas Water supply, sanitation, drainage, urban development (ii) Pipeline projects CDTA: Transformation of Urban Planning (\$1.2 million) PPTA: Urban Services Improvement Project (\$1.0 million) Grant: Pro-Poor Community Infrastructure and Basic Services (\$4.0 million) Loan: Urban Services Improvement Project (\$60.0 million) Loan: GMS Corridor Towns Development Project (\$60.0 million) (iii) Ongoing projects PDA: Demonstrating a Community-Led Approach to Improved Sanitation in Yangon (\$50,000)	(i) Planned key activity areas Water supply, sanitation, and drainage improved in selected cities (ii) Pipeline projects with access to sanitation, and drainage Number of households Reforms for water utilities lead to improved performance and self-improved water supply, financing capacity systems increased (iii) Ongoing projects the Dawbon township will benefit from improved sanitation and solid-waste About 1,700 people in management

ADB = Asian Development Bank, CDTA = capacity development technical assistance, GMS = Greater Mekong Subregion, PDA = pilot demonstration activity, PPTA = project preparatory technical assistance.

^a Baseline to be established by the end of 2014. Source: ADB.

Problem Tree for Urban Development and Water Sector

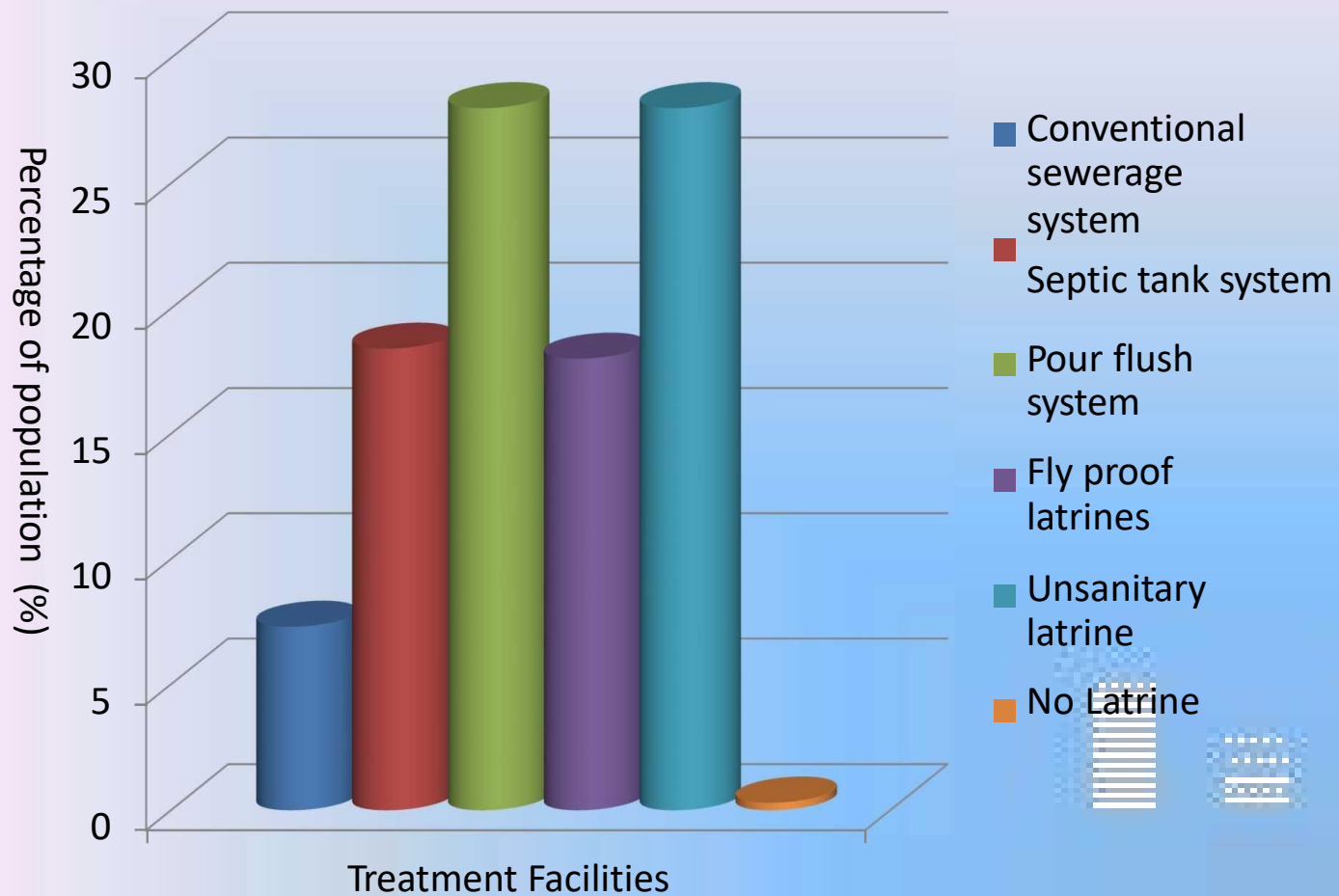


Wastewater Treatment Related Ministries

(Various agencies and department engaged in wastewater sector)

Agency/Department	Ministry/City/Others	Type of Sanitation Facility
Yangon City Development Committee	Yangon	- Sewerage, septic system, Pit latrine with slab - Activated sludge wastewater treatment plant
Naypyitaw City Development Committee	Naypyitaw	- Sewerage, septic system, Pit latrine with slab wastewater treatment plant
Mandalay City Development Committee	Mandalay	- Septic tank system - Oxidation pond
Water and Sanitation Division Building Department	Construction	- Septic tank system
Department of Development Affairs	Border Affairs	-Septic tank system , Pit latrine with slab
Environmental Sanitation Division Department of Health	Health and Sports	- Systematic latrine Construction

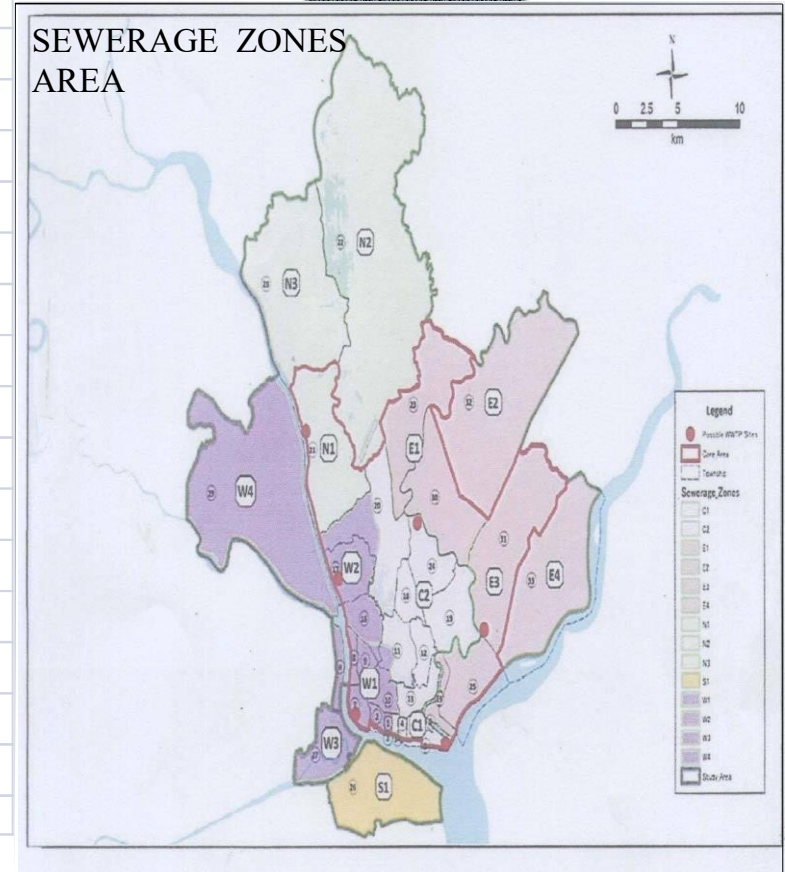
Status of Sewage Treatment in Myanmar



Source – Progress in drinking water and sanitation. Joint monitoring programme 2015.

Master Plan of Sewerage Zoning

Zone	Township
C1	Botahtaung, Puzundaung, Kyauktada, Pebedam,
W1	Lanmadaw, Latha, Alone, a part of Kyeemyintdaing, Dagon, a part of Bahan, a part of Kamaryut, Sanchaung
C2+E1	a part of Bahan, Mingalartaungnyunt, Yankin, Thingangyun, Tamwe, S-Okkalapa, a part of Mayangone, N-Okkalapa, N-Dagon
W2	a part of Kamaryut, Hlaing, a part of Mayangone
E3	Taketa, Dawbon, S-Dagon
N1	Insein
E4	Dagon Seikkan
E2	East Dagon
N2	Mingalardon
N3	Shwepyithar
S1	Dala
W3	a part of Kyeemyintdaing, Seikgyi khanaungto, Seikkan
W4	Hlaing Tharyar



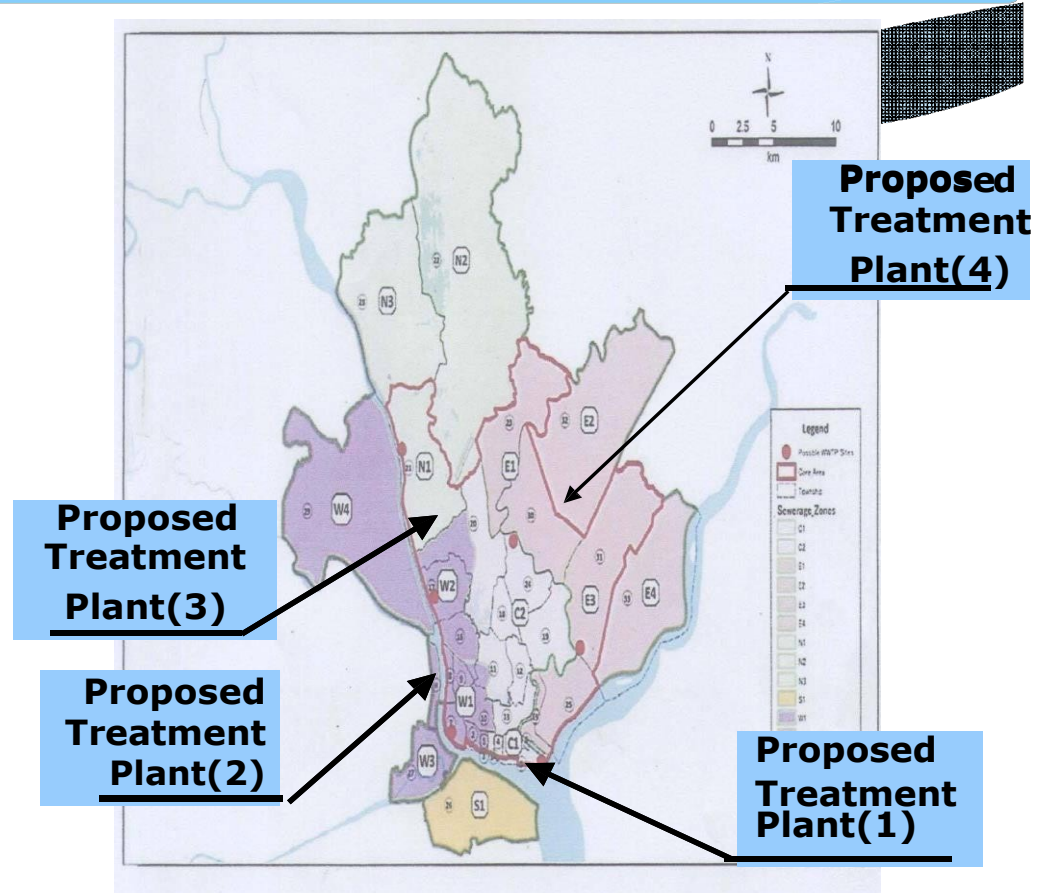
Location Plan of Proposed Wastewater Treatment Plants in Yangon

South District
Proposed (1) Operate (2006)
W.W.T.P (Thanhlatsoon)

West District
Proposed (2)
W.W.T.P
Thitaw Street, Alone Township.

North District
Proposed (3)
W.W.T.P
Padakaung, Hlaing Township.

East District
Proposed (4)
W.W.T.P
Thitponeseik, North Dagon Township.



Business support

After the enactment of a new foreign investment law in November 2012 high added value / high revenue potential sectors such as oil & gas, power generation, industrial zone development and related port and maritime infrastructure attracted massive foreign investor interest. Development partners like the World Bank and Asian Development Bank are involved in the field of water via technical assistance grants, concessional loans and a Trust fund, NL funded Water programme (USD 15M).

Others are IFC, UNDP, EU, and EIB. Furthermore the engagement of private finance (equity & debt) through PPP arrangements or other forms of private sector participation is rapidly developing. In the Netherlands the following instruments are available:

- Private Sector Investment Programme (PSI)
- Infrastructure funds DRIVE
- PPP Water for Myanmar.
- NUFFIC study scholarships

Part (2)
Myanmar Water Engineering & Products
Co., Ltd.

Presentation
For
Water & Wastewater Business
in Myanmar



Myanmar Water Engineering and Products Co., Ltd.
mwepmyanmar@gmail.com
www.facebook.com/mwep.myanmar/

About MWEP

Company name Myanmar Water Engineering and Products Co., Ltd.

Founded in 1994 May

Managing Director Ms. Pwint Ei Phyu

Sales USD 0.6 Million (as of FY2017, 1USD = 1360 MMK)

Joint Venture Wellthy Corporation (Japan)

mwepmyanmar@gmail.com, pwinteiphyu.pep4@gmail.com

MYANMAR WATER

ENGINEERING AND PRODUCTS CO.,LTD



Business Overview



Water and Wastewater Engineering (EPC)



Teaching and Trainings

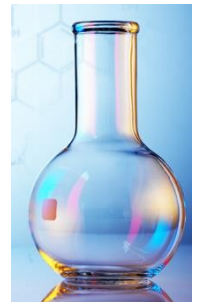
Multidisciplinary fields
(Project-oriented Company)

Environmental
consultation/studies/
assessment reports
for IEE,EIA,EMP,ETP

25 years of experience
in Myanmar

Operation and
Maintenance

Water Quality Analysis



Over **100** turnkey projects of Water and Wastewater treatment installed by MWEP in Myanmar.

MYANMAR WATER
ENGINEERING AND PRODUCTS CO.,LTD



What do we do?

Our Scope of Engineering

Water Treatment Systems

- Pre-treatment systems
- Lime soda softening process
- Solid contact clarifier/ clari-flocculators
- Plate type/ lamella clarifiers
- Rapid sand gravity filters/ pressure filters/ self cleaning filters
- Media filters (Activated carbon/ Iron removal/ heavy metal removal/ anthracite)
- Disinfection (Chlorination/ UV/ Ozone systems)
- Compact Potable Water Treatment Unit
- Water Softener
- Chemical Dosing System

Membrane-based Treatment Systems

- Pre treatment units to membrane-based treatment
- Ultra filtration treatment systems
- Reverse osmosis treatment systems
- Compact skid mounted RO units
- Desalination Units



MYANMAR WATER

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What do we do?

Our Scope of Engineering

Wastewater Treatment Systems

Anaerobic Biological Treatment

- Sludge Digestion
- Anaerobic Bio-filter
- Anaerobic Digesters (UASB)
- Continuous Stirred-tank Reactor (CSTR)

Aerobic Biological Treatment

- Conventional Activated Sludge Process (CAS)
- Attached Growth / Suspended Growth Bio-film Technologies
- Package Plants (Skid Mounted Container)
- Membrane Bio-reactor (MBR)
- Moving Bed Bio-film Reactor (MBBR)

Laboratory

- Water & Wastewater Analysis
- Laboratory equipment, instrument, chemicals and apparatus Supply



MBBR Media



MYANMAR WATER

ENGINEERING AND PRODUCTS CO.,LTD



Our Valuable Customers

Food & Beverages

- Myanmar CP Livestock Co., Ltd.
- Pyi lone Chan Tha Co., Ltd. (Fish Processing)
- International Beverages Trading Co., Ltd. (IBTC)
- Golden Queen Alcohol Distillery
- Shwe Yee Win Alcohol Distillery



Hospitals

- Asia Royal
- Bahosi
- 500 Bedded Yangon Speciality
- Grand Hantha International

Consultancy Services

- Smart Myanmar
- Puls Trading Far East Ltd. (H&M)
- United Nation Industrial Development Organization (UNIDO)

Real Estate

- Serge Pun & Associates Ltd. (SPA)
- First Myanmar Investment Public Company Ltd.
- Yangon City Development Committee (YCDC)
- Tet Lann Co., Ltd.
- One Nine Construction Co., Ltd.

Hotels

- Myat Min Co., Ltd. (Novotal Hotel, Inle)
- Family Business Group Construction Co., Ltd. (Sheraton Hotel, Yangon)

Garment

- Ree blue Myanmar Ltd.
- Jui Seing Co., Ltd.



DENMARK

MYANMAR WATER

ENGINEERING AND PRODUCTS CO.,LTD



MWEP's Affiliated Companies

Siam Machinery and Equipment Co., Ltd. (Thailand)

Liquid Purification Engineering International Co., Ltd. (Thailand)

Shinmaywa M.R.M Co. ,Ltd. (Thailand / Japan)

Thanachai Sales and Services Co., Ltd. (Thailand)

I-Lab Fluid Control Co., Ltd. (Thailand)

Thai Inter Lamp Co., Ltd. (Thailand)

Prominent Fluid Controls Co., Ltd. (Thailand / Germany)

TPG Motors & Drive (USA) L.L.C

Mitsubishi Chemical Aqua Solutions Co., Ltd (Japan)

Nikkiso Eiko Co., Ltd. (Japan)

Nihon Suido Consultant Co., Ltd. (Japan) (Under negotiation for JV)



-Applications in Myanmar - - Challenges - - Potential Business -



Applied Technologies in Myanmar

- **Water Treatment Technology**
 - (1) Conventional Filtration System
 - (2) Chemical Treatment System
 - (3) Ultra-filtration Membrane Technology
 - (4) Reverse Osmosis System
 - (5) Desalination

Applied Technologies in Myanmar

- **Wastewater Treatment Technology**

- (1) Conventional Filtration System
- (2) Chemical Treatment System
- (3) Conventional Activated Sludge (CAS)
- (4) Moving Bed Biofilm Reactor (MBBR)
- (5) Ultra-filtration Membrane Technology (MBR)
- (6) Upflow Anaerobic Sludge Blanket (UASB)
- (7) Sludge Dewatering System
- (8) Dissolved Air Floatation (DAF).....etc....

MBR Applications in Myanmar

Domestic Industrial

S/N	Project Name	Capacity (m3/day)	Status	Location
1	Star City Zone A	1100	Completed (Total – 8 Projects) in Yangon	Thanlyin Tsp
2	YCDC Residents housing	30/38		Mangalar Taung Nyunt Tsp
3	City Golf	10		Insein Tsp
4	Ila Condo	50		Dangon Seikkan Tsp
5	Royal Myanmar Education center	60		Thanlyin Tsp
6	Myanmar Padauk	20		Panzuntaung Tsp
7	First Printing	5		Shwe Pyi Thar Tsp
8	Pyi Lone Chan Tha (Fish Processing)	10		Shwe Pyi Thar Tsp
9	Star City Zone C	480	Ongoing (Total – 3 Projects)	Thanlyin Tsp
10	Sheraton Hotel	190		Tamwe Tsp
11	Grand Hantha International Hospital	40		Kamayut Tsp

- ✓ Purchase History (2013-2018) – Approximately JYP 20 Millions (USD 0.19 Millions)
- ✓ 12 Wastewater treatment using MBR are installed in Myanmar.

MYANMAR WATER
ENGINEERING AND PRODUCTS CO., LTD.



Challenges in Myanmar

Japanese Bodies in Myanmar

- Japan International Cooperation Association (JICA)
- Nippon Koei Consultants Co., Ltd
- Oriental Consultants Japan Co., Ltd

Others

- Responsible Business Fund (Denmark)
- Unido
- GIZ

Reason

- Financial Constraints
- Awareness in Technology
- Law Enforcement
- Conservative Party (JICA)
- Market Penetration by Flat Sheet

Business Approach

BOT or PPP or Loans or Grant

Business Potential

- One existing WWTP in Mdy-IZs with BOT (Pending)
- JICA Loan Water Treatment Projects in 13 Division (Phase I completed, Phase II ongoing)
- Water Supply Development Project in 10 zones of Greater Yangon with PPP

International
Local
Hybrid

Investment

MYANMAR WATER

ENGINEERING AND PRODUCTS CO.,LTD



UASB-MBBR Applications in Myanmar

D
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S/N	Project Name	Capacity (m3/day)	Status	Location
1	British School Yangon	110	Completed	Mayangone Tsp
2	Shwe Yi (Distillery)	12	Ongoing	Mandalay
3	Leather Tannery Mdy (Centralized Wwtp)	280	Ongoing	Pyigyitagon, Mandalay
4	Monywa Izs (Centralized Wwtp)	800	Ongoing	Monywa
5	Unido (Ygn/ Mdy) (Centralized Wwtp)	About 1200	Potential	Ygn/ Mdy
6	Centralized WWTP Construction Project	-	Pending	Mandalay IZs

6. Centralized WWTP Construction Project

Project Life 50 years (BOT)

Investment USD 10.3 million



DENMARK

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WWTP – Applications –

Shwe Yi Distillery (12 m³/day)



UASB Process

Star City Zone-C (480 m³/day)



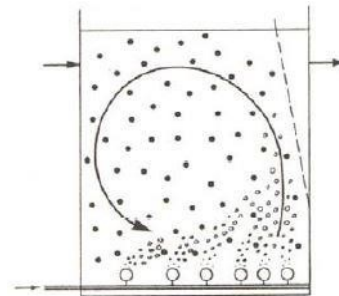
Membrane Element



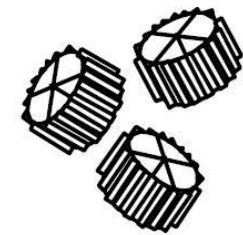
Membrane Module

MBR Process

British School Yangon (110 m³/day)



MBBR Process



The shape of biofilm carrier

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Project Examples 4: Sewage Treatment (MBR)



Star City (Thanlyin) (1100 m³/day)



Capacity: **1100 m³/day**, Upgraded
Project: Star City (Thanlyin) Housing Estate
Client: Thanlyin Estate Development Co., Ltd.
Type: Combined/ MBR/ WWTP
Operated in: April, 2015
Located in: Thanlyin Township, Yangon



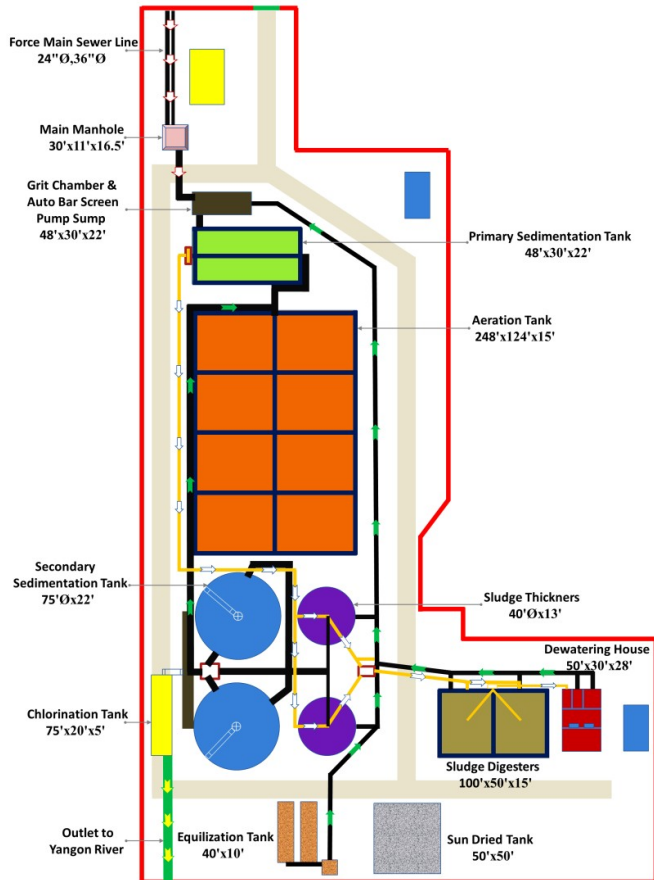
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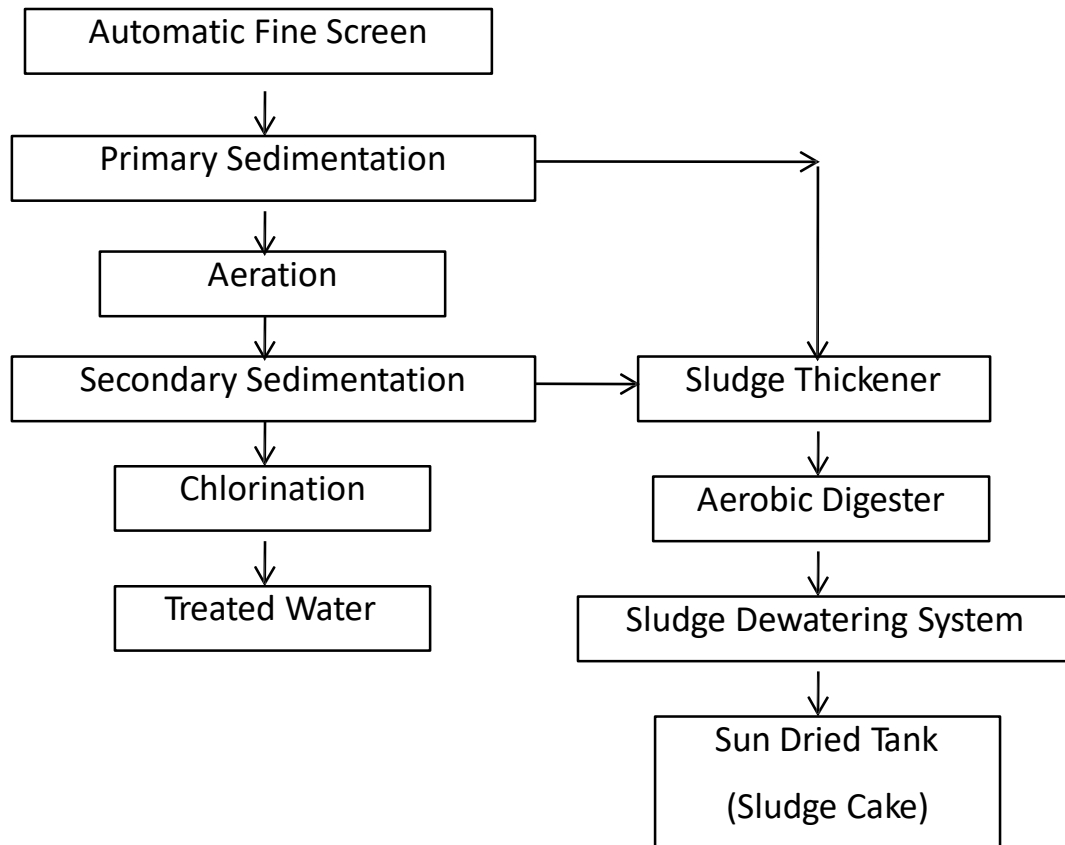
Project Examples 1: Sewage Treatment

Area Map



Area – 5.56 Acres
Population – 300,000

Process Flow Diagram



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Project Examples 1: Sewage Treatment (CAS)



Capacity: **14775 m3/day**
Project: Central Business District (CBD)
Client: YCDC
Type: Sewage/ CAS/ WWTP
Operated in: 2004
Located in: Botahtaung Township, Yangon

Central Business District (The Biggest Sewage Treatment in Myanmar)



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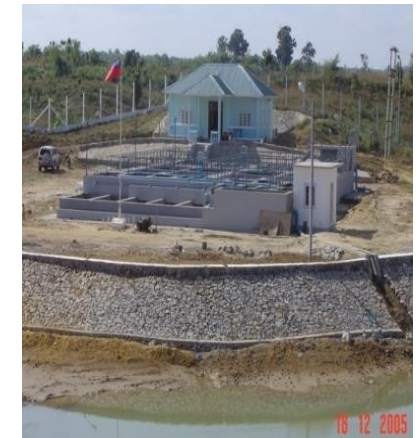


Project Examples 2: Sewage Treatment (CAS)

Naypyitaw (The Second Biggest Sewage Treatment in Myanmar)



Capacity: **1600 m3/day**
Project: Sewage Treatment Plant
Naypyitaw Development
Client: Committee
Type: Sewage/ CAS/ WWTP
Operated in: 2006
Located in: Pyinmana Township, Naypyitaw



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Project Examples 12: Industrial Wastewater Treatment (UASB & CAS)



Shwe Yee Win Distillery (500 m³/day)



Capacity: **500 m³/day**
Project: Shwe Yee Win
Type: Distillery Waste/ WWTP
Operated in: 2017
Located in: Twante Township, Yangon

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Project Examples 16: Industrial Wastewater Treatment (CAS)

Capacity: **100 m³/day**
Project: Myanmar CP
Client: Myanmar CP livestock Co., Ltd.
Type: Chicken Process Waste/ WWTP
Operated in: 2014
Located in: Yangon



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Project Examples 14: Industrial Wastewater Treatment (Chemical & CAS)

Capacity: **1000 m³/day**
Project: Ree Blue Garment (Jean)
Type: Garment Waste/ WWTP
Operated in: 2016
Located in: Shwe Pyi Thar Township



Ree Blue Garment (1000 m³/day)



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Project Examples 1: Potable Water Treatment

Capacity: 200 m³/hr

Type: Potable WTP

Source: River Water

Client: High Tech Co., Ltd.

Operated in: 2005

Located in: Yeywa, Mandalay

For Yeywa Hydro-Power Plant



Compact Potable Water Treatment at Yeywa



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Project Examples 2: Potable Water Treatment

Compact Potable Water Treatment at Thagaya



Capacity: **100 m³/hr**

Type: Potable WTP

Source: Dam Water

Project: Thagaya Industrial Estate

Operated in: 2007

Located in: Thagaya, Bago



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Project Examples 4: Potable Water Treatment



**For Sitagu International Buddhist Academy
Compact Potable Water Treatment
at Sagaing (100 m³/hr) in 2006**



Water Source : Irrawady River

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Project Example: Desalination Plant (UF & RO)



Desalination at Thanlyin (120 m³/day) in 2015

Pre-treatment : Ultra Filtration Membrane

Water source : Bago River



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Project Example : Desalination Plant (UF & RO)

Desalination at Thanlyin (120 m³/day) in 2015

Pre-treatment Ultra Filtration

Water source : Bago River



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Part (3)

National Water Supply & Wastewater Management Projects in Myanmar

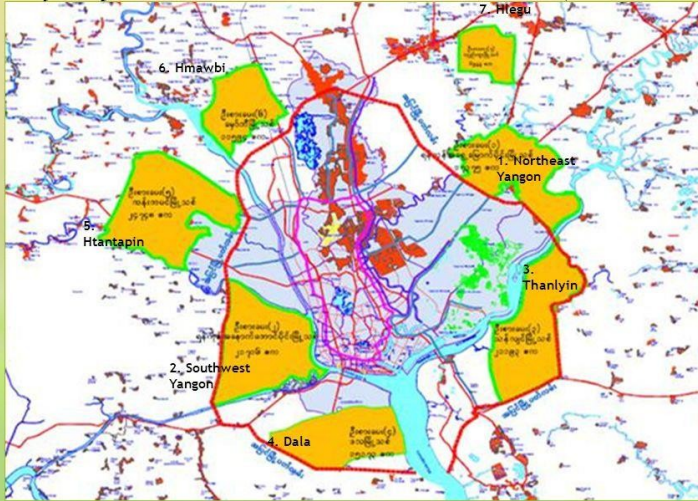


New Yangon City Project in Yangon



Yangon City Development Committee

Priority Projects for Extension of New Urban Areas (118732 Ac.)



Priority Projects for Extension of Yangon New Urban Area

NYDC received **77 EOIs** submissions, and the breakdown of the number of EOIs for each project is below:

- 1) Power Supply and Distribution (20 EOIs)
- 2) Public Transport System (7 EOIs)
- 3) Cyber Connectivity Infrastructure (13 EOIs)
- 4) Municipal Waste Disposal (15 EOIs)
- 5) Natural Gas Supply and Distribution (14 EOIs)
- 6) Convention Center (8 EOIs)



Contact:

No.56, Chindwin Road, Kamayut Township, Yangon, Myanmar

+95 12306377 ; contact@nydc.com.mm

New Yangon City Project : Phase (1)



Industrial Zones (Myanmar)

- Total 41 Industrial Zones (excluding Industrial Parks)
- Yangon : 23 Izs
- Other Cities : 18 Izs
- 11 Planned Izs in 11 Townships in Yangon



Yangon Industrial Zones in the downstream of Hlaing River

- No Central Industrial Wastewater Treatment Plants in most of existing Izs but plan to install CIWWTP in newly Izs
- Most Small & Medium Enterprises (SMEs) located in IZs

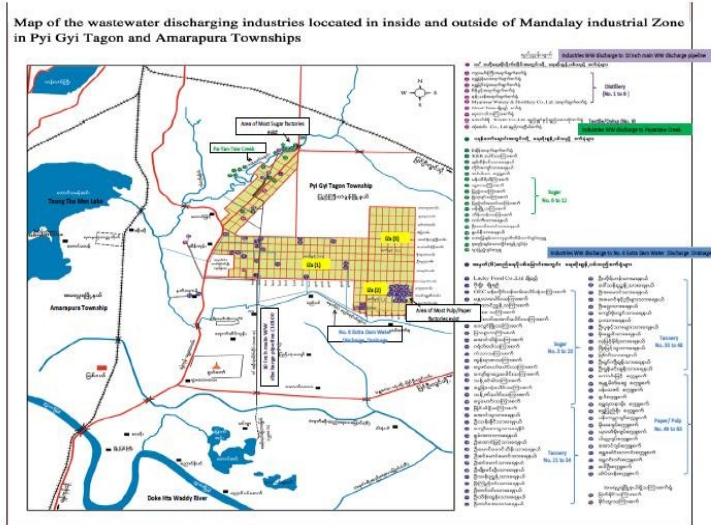


Figure 1. Map showing the pollution pathways with the locations of Mandalay Industrial Zones in Pyi Gyi Tagon and Amarapura Townships (Reference from ECD)

Mandalay Industrial Zones in Pyi Gyi Tagon & Amarapura Townships

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Project for Capacity Development in Basic Water Environment Management and EIA System in the Union of Myanmar conducted by JICA. (2015 ~ 2018)

- To implement the Environmental Law in national and local level , the cooperation of Union of Myanmar Government and Japan International Cooperation Agency (JICA) was conducted in 23 December 2014.
- **Overall goal** : Impact of Industrial effluents from industrial zones on river water quality is alleviated and advanced EIA approach for complicated issues are taken into account.
- **Project Purpose** : Capacity for developing basic water pollution control measures based on obtained and interpreted information is enhanced and the institutional frame work of the EIA review works is establish.

Project for Capacity Development in Basic Water Environment Management and EIA System in the Union of Myanmar conducted by JICA. (2015 ~ 2018)

Outputs

Output(1) : Inspection Procedure is Standardized (Water Environmental Management)

(2) : Capacity for implementing water quality survey to obtain reliable information is enhanced. (Water Environment Management)

(3) : Database of water pollution sources and river water quality is developed. (Water Environment Management)

(4) : Capacity of interpreting the information for water pollution control measures is enhanced. (Water Environment Management)

(5) : Necessary technical manuals and forms of the EIA review are developed.(EIA)

(6) : Capacity of MONREC and the EIA Report Review Body on the EIA review is enhanced. (EIA)

"The Greater Yangon Water Supply Improvement Project (MY-P5)"

The ODA Loan agreement was concluded between The Government of the Republic of the Union of Myanmar and Japan International Cooperation Agency (JICA) on 5 September 2014, to provide concessional loans of up to a total of **23 billion Japanese Yen**. The objective of the project is to enhance water supply service by expanding water treatment facilities and improving distribution network, thereby contributing to improvement in the living environment of regional residents in Greater Yangon. **"The Greater Yangon Water Supply Improvement Project (MY-P5)"** has been implementing in collaboration with Japan International Cooperation Agency (JICA) and Yangon City Development Committee (YCDC) and will be ended in 2022

The project aims at improving water supply services to meet the increasing water demand by using **raw water from the Kokkowa River and constructing a new Water Treatment Plant and construction and rehabilitation of associated transmission and distribution facilities**, which in turn will contribute the improvement of living environment and economic development of Yangon City

Preparatory survey for greater Yangon water supply improvement project (phase II) :

- **Publisher** : Japan International Cooperation Agency, TEC International Co., Ltd, Nippon Koei Co., Ltd., NJS Consultants Co., Ltd.
- The project aims at improving water supply services to meet the increasing water demand by using raw water from the Kokkowa River and constructing a new Water Treatment Plant and construction and rehabilitation of associated transmission and distribution facilities, which in turn will contribute the improvement of living environment and economic development of Yangon City

JICA : Yangon Sewerage System Development Project

Project Life 40 years

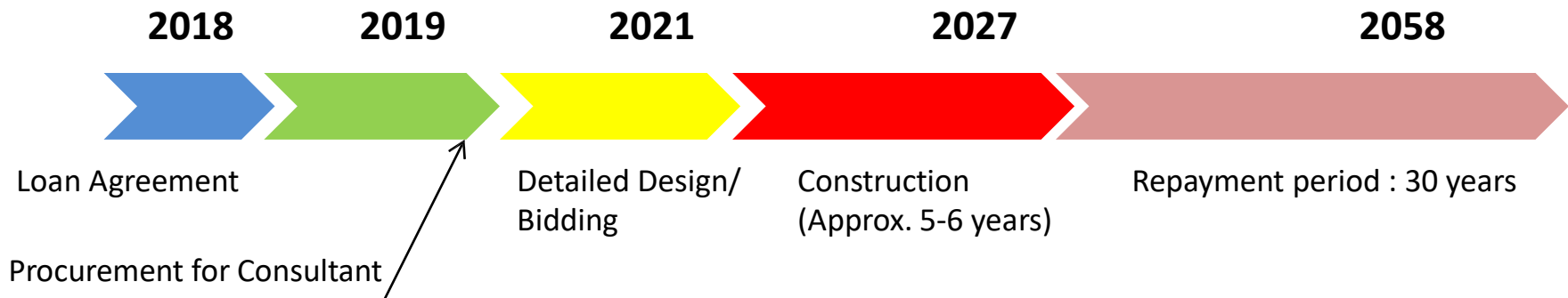
Loan Amount JPY 45900 million
(JICA ODA)

Area of Service Central Business Zone

Scope of Project

- Main sewer
- WWTP 112,000 m³/day, **MBR**

- Upgrade Existing WWTP 14775 m³/day within the same compound
- **MBR**
Flat sheet Or Hollow Fibre Membranes



So how can we cooperate

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Netherlands government and loans from two Netherlands banks for a water supply project in Pyigyitagun township, Mandalay Region.

The project will purify water from the Dutthawadi River and supply 70 percent of the township's needs. Currently, a project of the Japan International Cooperation Agency provides 30pc of the township's water.

The grace period for the loan is three years, while the repayment period is 10 years. The interest rate is 2.3pc, so about K5 million will have to be invested in water meters and completed by 2021

The Amarapura Project - Improving Water Service in Mandalay City

The Amarapura Project aims to provide new access to water services for at least 2,000 households in the Amarapura Township and implement incentive measures for these households to connect to the networks.

This Project was initiated by the **Agence Française de Développement (AFD)** in partnership with **Mandalay City Development Committee (MCDC)**. AFD provided **a grant of 2.5 million Euros to MCDC to finance this project** which is currently under implementation with the support of GRET in consortium with the French consulting firm Suez Consulting.

20,000 water meters in Pyigyitagun at a cost of €59.92 million (K103.4 billion) will install at Pyigyithagun Township, of which the Netherlands government will provide half as a grant and the loans for the rest is accomplished by others sources.

Japan to fund Mandalay water treatment facility

A wastewater treatment and quality monitoring facility for textile factories in Mandalay will be the first project Japan will fund under its environmental cooperation agreement with Myanmar.

The experimental project will be built in Wundwin township, where there are a lot of textile factories, according to the memorandum of cooperation that is expected to be signed by the two countries early next month, said U Hla Maung Thein, director general of the Environmental Department at the Ministry of Natural Resources and Environment Conservation (MONREC).

Makiko Arima of the International Cooperation Office, Global Environmental Bureau, in Japan's Environment Ministry (MOEJ) said she hopes the agreement will be signed soon.

Myanmar: Mandalay Urban Services Improvement Project

The **Asian Development Bank (ADB)** is working with Myanmar to help Mandalay improve its water and sanitation services. The project is building a new water treatment plant and upgrading and extending the existing supply network. It is also building the city's first centralized wastewater collection and treatment plant, which will produce biogas from sludge and help power the plant.

Project Status

Active

Project Type / Modality of Assistance

Grant / Loan

Source of Funding / Amount

Grant 0455-MYA: Mandalay Urban Services Improvement Project

Urban Climate Change Resilience Trust Fund
under the Urban Financing Partnership Facility

US\$ 4.00 million

Loan 3316-MYA: Mandalay City Urban Services Improvement Project
concessional ordinary capital resources lending/
Asian Development Fund

US\$ 60.00 million

Loan: Mandalay City Urban Services Improvement Project

Agence Francaise de Developpement

US\$ 46.00 million

Asia Investment Facility

US\$ 6.80 million

Myanmar : Second Mandalay Urban Development Project

Project Name	Second Mandalay Urban Services Improvement Project
Project Number	50109-002
Country	Myanmar
Project Status	Proposed
Project Type / Modality of Assistance	Grant Loan
Source of Funding / Amount	
Loan: Second Mandalay Urban Services Improvement Project concessional ordinary capital resources lending / Asian Development Fund	US\$ 150.00 million
Strategic Agendas	Environmentally sustainable growth Inclusive economic growth
Drivers of Change	Gender Equity and Mainstreaming Governance and capacity development Partnerships
Sector / Subsector	Transport / Urban public transport Water and other urban infrastructure and services / Urban sanitation - Urban sewerage - Urban solid waste management - Urban water supply

Central Industrial Wastewater Treatment Plant to be established in Mandalay Industrial Zone (2)

The project to establish a central industrial wastewater treatment system has started in Mandalay Industrial Zone (2) in Mandalay Region with 65 percent financial aid from **Responsible Business Fund (RBF) of Denmark** and 35 percent aid from local SMEs.

The treatment plant can treat over 60,000 gallons of wastewater from 23 leather processing factories. There have been reports that wastewater from Mandalay Industrial Zone is flowing to Dokhtawady River through a 10-inch pipe without being treated.

The project will cost over **K500 million**. RBF will provide 65 percent (K328.5 million) and SME owners 35 percent. The land for the project has been bought by those SME owners.

An agreement was signed in mid-October this year to implement the project which is due to be completed in six months, said an official from **Myanmar Water Engineering and Products Co Ltd. (MWEP)**

Wastewater Treatment Plant at Monywa industrial zone 70% complete.

The wastewater treatment plant in the leather and vermicelli section of the Monywa industrial zone is now 70 per cent complete, said U Wei Tint, who runs a vermicelli business and is the chair of the wastewater treatment plant construction committee.

The committee signed an agreement with a **Responsible Business Fund (RBF) Denmark delegation** to construct the wastewater treatment plant by 31 December, 2019.

“The construction of the plant is estimated to cost K1,500-2,000 million. Therefore, it could not be financed by the 15 businesses as they could bring in only K750 million. Fortunately, they linked with an organization funded by the Denmark government and received a contribution of K750 million. The Denmark delegation also provided a K170-million biogas generator and other equipment valued at K40 million,” said U Wei Tint. The project is developed by **Myanmar Water Engineering & Products Co., Ltd. (MWEPC)**

UNIDO : Climate change mitigation through methane-recovery and reuse from industrial wastewater treatment in Myanmar.

Project Overview

- **Project Objective:** Increasing Myanmar's efforts towards climate change mitigation by minimizing GHG emissions through the application of integrated low-emission wastewater treatments and the Transfer of Environmentally Sound Technologies (TEST).
- **Donor:** Global Environment Facility (GEF)
- **Budget:** GEF Grant: 3,984,589 USD, Co-financing: 19,105,322 USD Project Preparation Grant (PPG): 125,000 USD
- **Duration:** 5 years • **Lead partner:** Department of Urban and Housing Development, Ministry of Construction
- **Status:** The project is currently in the design phase (PPG) of the project document, with activities expected to start on the ground in 2019, upon approval by the GEF.

UNIDO : Resources Efficiency & Cleaner Production (RECP) Project in Myanmar

A pilot **Resource Efficient and Cleaner Production (RECP)** programme in Myanmar will be implemented by the United Nations Industrial Development Organization (UNIDO), the UN's specialized agency has said.



The project will target the food processing, textile and tourism sectors in Yangon and Mandalay regions, and will introduce clean technology to goods and services industries in Myanmar, UNIDO said.

The project will be funded by the State Secretariat for Economic Affairs of Switzerland (SECO), a key supporter of the RECP programme.

“UNIDO, in collaboration with the Ministry of Industry, as well as other government agencies and private sector actors, aims to help improve resource productivity and environmental performance of Myanmar enterprises, in particular SMEs,” said Rene Van Berkel, chief of UNIDO’s Cleaner and Sustainable Production Unit.

Budget: USD 565,000,

Donor: SECO Main Counterparts: Ministry of Industry

UNIDO : Improvement of Industrial Energy Efficiency (IEE) in Myanmar Project

Energy efficiency is the cornerstone of good energy policy; it provides multiple benefits for meeting security, environmental, and economic goals. In addition, it is highly cost-effective and smart: smart from a government perspective, and smart from a business perspective.

The Government of the Republic of the Union of Myanmar has recognized the importance of energy efficiency and has set targets, along with the other ASEAN Countries. It is known by Ministry of Industry that at least 40% of energy usage in Myanmar could be save as of estimated by International Experts and 12% in 2020, 16% in 2025, 20% in 2030 would be reduce according to Energy Efficiency Policy.

Project Objective: To promote sustained Green House Gas (GHG) emissionn reduction in the Myanmar industry by: improving policy and regulatory frameworks; institutional capacity building for industrial energy efficiency (IEE); implementation of energy management system (EnMS) based on ISO 50001; and optimization of energy systems in industry.

Budget: USD 2,830,000,

Donor: GEF Main Counterpart: Ministry of Industry



SMART MYANMAR IS A SWITCH ASIA PROJECT FUNDED BY THE EUROPEAN UNION AND IMPLEMENTED BY



IN COOPERATION WITH





About SMART Myanmar

SMART Myanmar is funded by the European Union and builds on the initial SMART project implemented between 2013-2015. SMART actively supports and promotes sustainable consumption and production (SCP) of garments “Made in Myanmar” – a concept with emphasis on **resource efficiency** and **social responsibility**.

Working closely with companies and business support organizations located in Myanmar, SMART builds capacity by increasing skills and knowledge in local partner organizations to realize a switch to sustainable production that embraces social and environmental compliance. To assure the continuity of the project, local sustainability experts are trained to support Myanmar manufacturers in addressing international standards, ensuring improved working conditions and efficiency on a long-term basis. SMART Myanmar is being continued in a third phase as **SMART TaG**, a new project also funded by the European Union and co-funded by private sector partners (brands, retailers and factories). SMART TaG aims to further upscale, expand and strengthen responsible and sustainable manufacturing practices across the Myanmar garment industry and will publicly launch on December 6th, 2019, although some activities of the project began since May, 2019. This new project phase is funded by the European Union until 2022 and includes a new partner consortium involving sequa, amfori, the Confederation of Trade Unions Myanmar and the Centre for Economic and Social Development.

Rotary



How Rotary makes help happen

Through water, sanitation, and hygiene (WASH) programs, Rotary's people of action mobilize resources, form partnerships, and invest in infrastructure and training that yield long-term change

Rotary is a global network of 1.2 million neighbors, friends, leaders, and problem-solvers who see a world where people unite and take action to create lasting change – across the globe, in our communities, and in ourselves



Water for a community

Rotary clubs partnered with local organizations to install a rainwater harvesting and distribution center for 4,000 people in Madan, India. They also delivered training programs for women in the community and students in 35 schools.



WASH in Guatemala schools

Rotary clubs in Guatemala improved conditions for as many as 1,793 children in 10 schools in the town of Escuintla by providing toilets, washing stations, water tanks, and training



WASH in Guatemala schools

Rotary clubs in Guatemala improved conditions for as many as 1,793 children in 10 schools in the town of Escuintla by providing toilets, washing stations, water tanks, and training

End of session

Any question?

Thank you for your attention!

**MYANMAR WATER
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