



## 7<sup>th</sup> International Workshop on Decentralized Domestic Wastewater Treatment in Asia

### Current Activities on Domestic Wastewater Treatment in Mandalay City, Myanmar



Presented by

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**Committee Member**

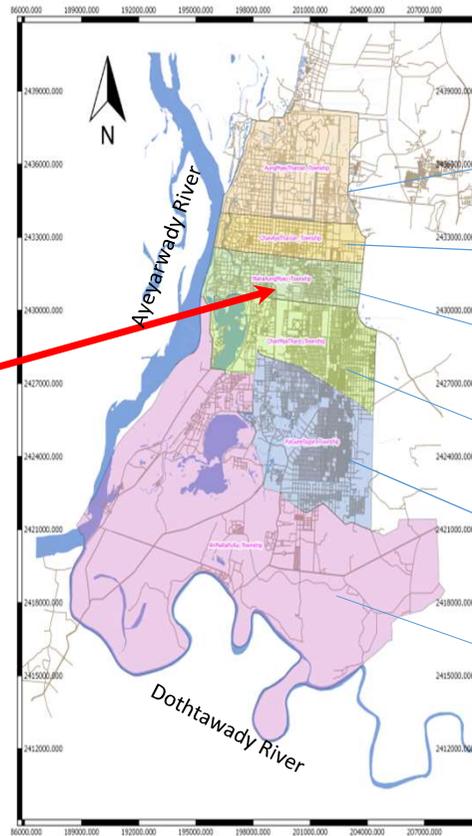
**Water and Sanitation Department**  
**Mandalay City Development Committee**  
**24<sup>th</sup> September, 2019 (Tuesday)**



# General Information About Mandalay City



Mandalay Region



Mandalay City

- AungMyayTharzan
  - ChanAyeTharzan
  - MaharAungMyay
  - ChanMyaTharzi
  - PyiGyiTagon
  - Amarapura
- (6) Townships

- Located in (21.98° North & 96.08° East)
- One of the Smart Cities among 26 cities in ASEAN
- 314.69 km<sup>2</sup> City Area
- 1.2 Million People (according to 2014 census)
- 1.8 Million People (projection for 2040)
- 1.7 % of population growth rate



## Our Mission & Vision



(1)

- To keep the city clean

(2)

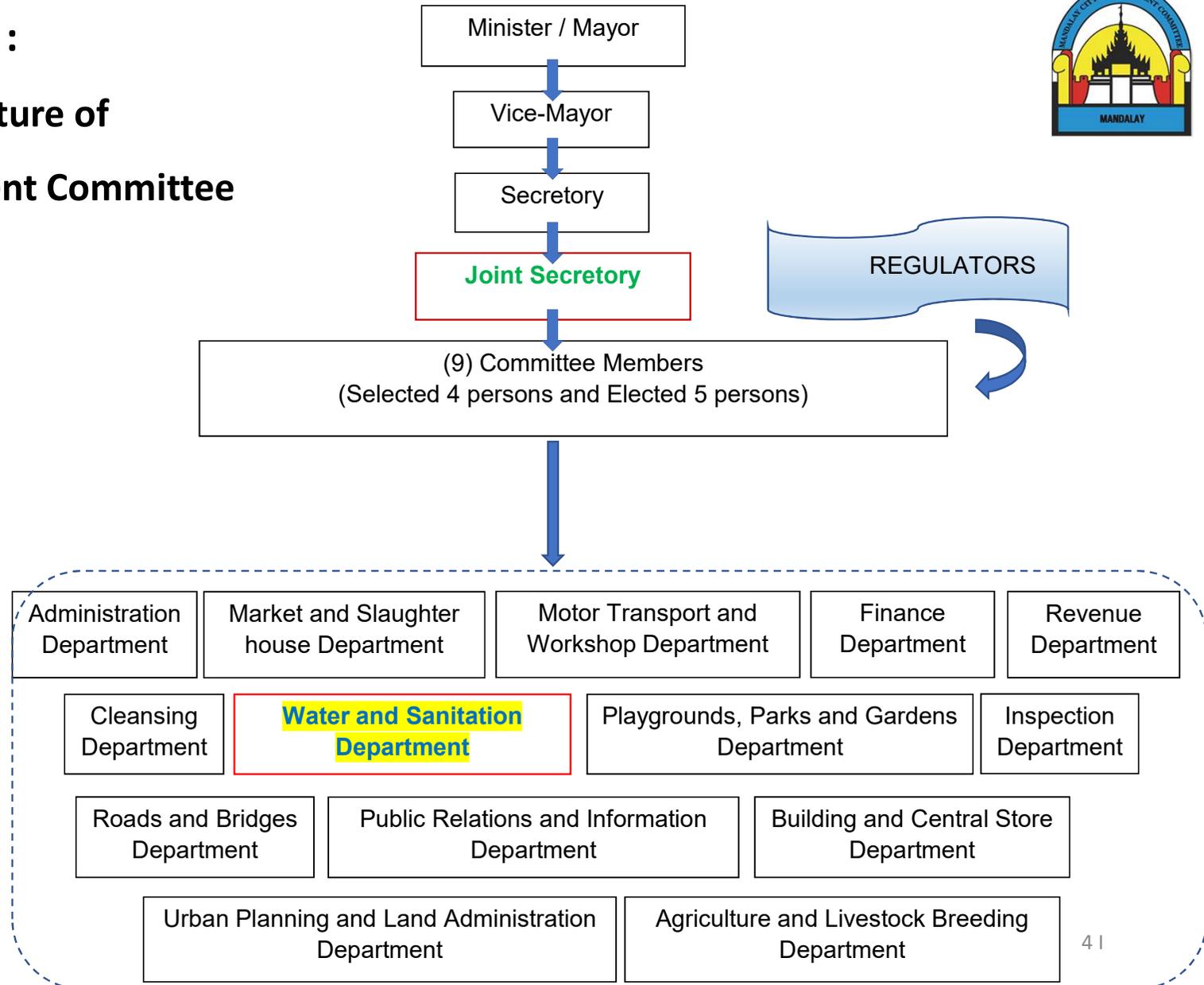
- To make the city beautiful

(3)

- To enable the city dwellers to enjoy the pleasant life



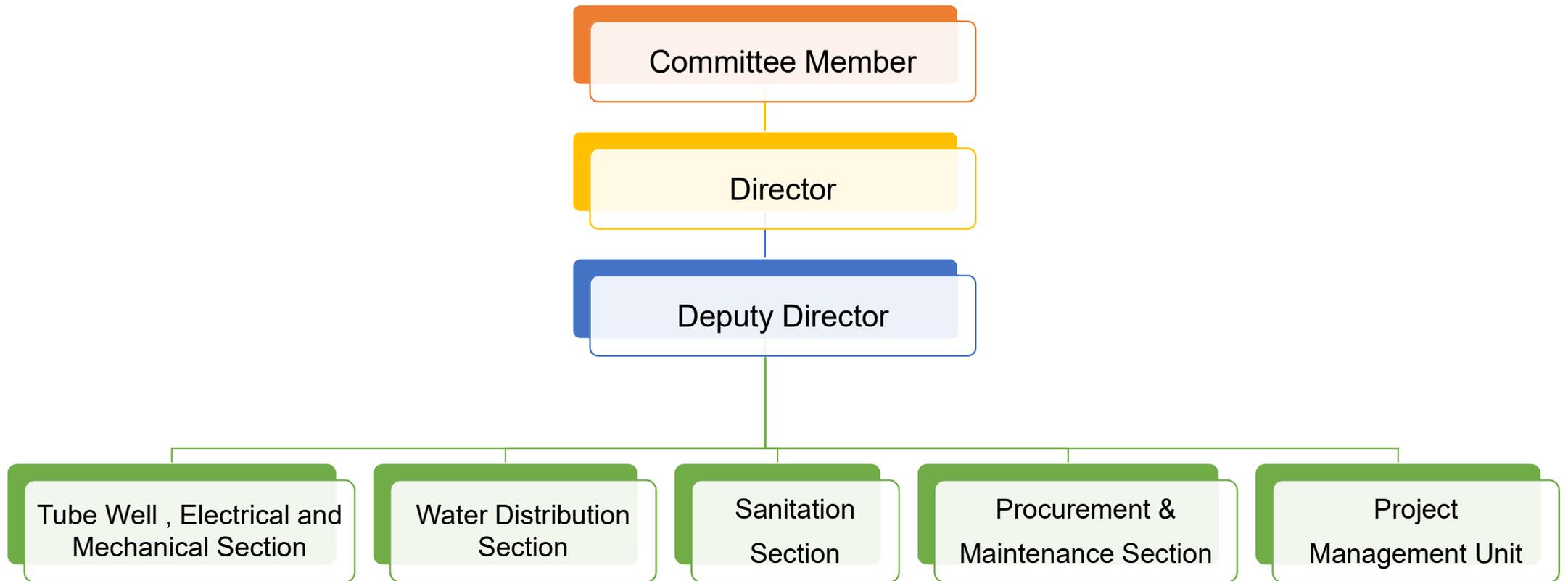
**Governance :**  
**Organization Structure of**  
**Mandalay City Development Committee**





# Water and Sanitation Department

# Organizational Structure of Water and Sanitation Department



# Responsibilities of Sanitation Section



- 1) Permit to individual septic tank construction for house hold.
- 2) Provide desludging service
- 3) Facility the mobile toilets at the public occasions
- 4) Provide public toilets
- 5) Solving the complaints of public
- 6) Control the sluice gate
- 7) Check and take action on Industrial waste disposing from the factories
- 8) Construction ,Operation, Maintenance and management of pumping stations



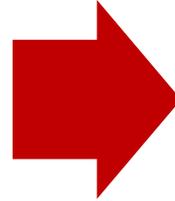


# Domestic and Industrial Wastewater

# Overview on Domestic Wastewater Situation



Grey water & Effluents from septic Tank



Directly discharge to 9 main drains

- ❖ Open drainage system
- ❖ Combined sewerage system
- ❖ Dispose directly to Ayeyarwaddy River from the city
- ❖ Dispose directly to Dotthawaddy River from Industrial zone
- ❖ Dispose directly to 2 storage lakes from 9 main drains (totally 36.64 miles)
- ❖ 8 storm water pumping stations
- ❖ No tariff on waste water



# New Flood Protection measures for Domestic Wastewater discharge



## Detention Pond

- 1) Location – Chanmyatharzi tsp
- 2) Construction period – 29.3.2019 ~ 1.8.2019
- 3) Investment Cost – 9096,00,000 MMK
- 4) Pump Capacity – 1,12,320 gal/hr
- 5) Pump type – Submersible Pump (3 operations & 1 standby)

## Sluice Gate

- 1) Location – Maharaungmyay tsp
- 2) Construction period – 8.3.2019 ~ 1.8.2019
- 3) Investment Cost – 550,00,000 MMK

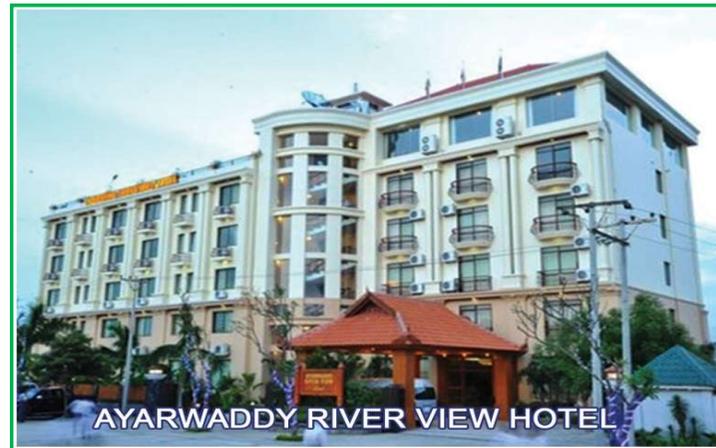
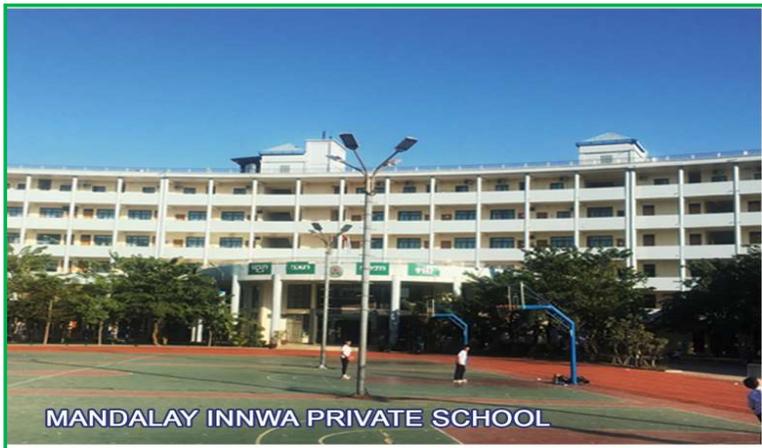
# Controlling for Domestic Wastewater effluent quality in drainage system

- 1) Location – Yu Nan Chinese Temple
- 2) Type of chamber – Compact grease trap
- 3) Capacity – 4.8 m<sup>3</sup>



# Controlling for

## Domestic Wastewater effluent quality in drainage system





# Controlling for Industrial Wastewater effluent quality in drainage system

- 1) Industries – (26) nos of Leather Factories
- 2) Investment cost – 5000,00,000 MMK (35 % by Businessman + 65 % by Responsible Business Fund (Denmark))
- 3) Construction Period – 6 months
- 4) Influent quantity – 1920 mg/l (BOD), 4000 mg/l (COD), 990 mg/l (SS)
- 5) Effluent quantity – < 50 mg/l (BOD), < 250 mg/l (COD), < 50 mg/l (SS)
- 6) Effluent capacity – 280 m<sup>3</sup>/day
- 7) Treatment System – Anaerobic Digester, Aerobic Digester, Chlorination
- 8) PH level – 7 ~ 9
- 9) Methane gas – collected by tank





# Sanitation



## Current Sanitation Situation in Mandalay City

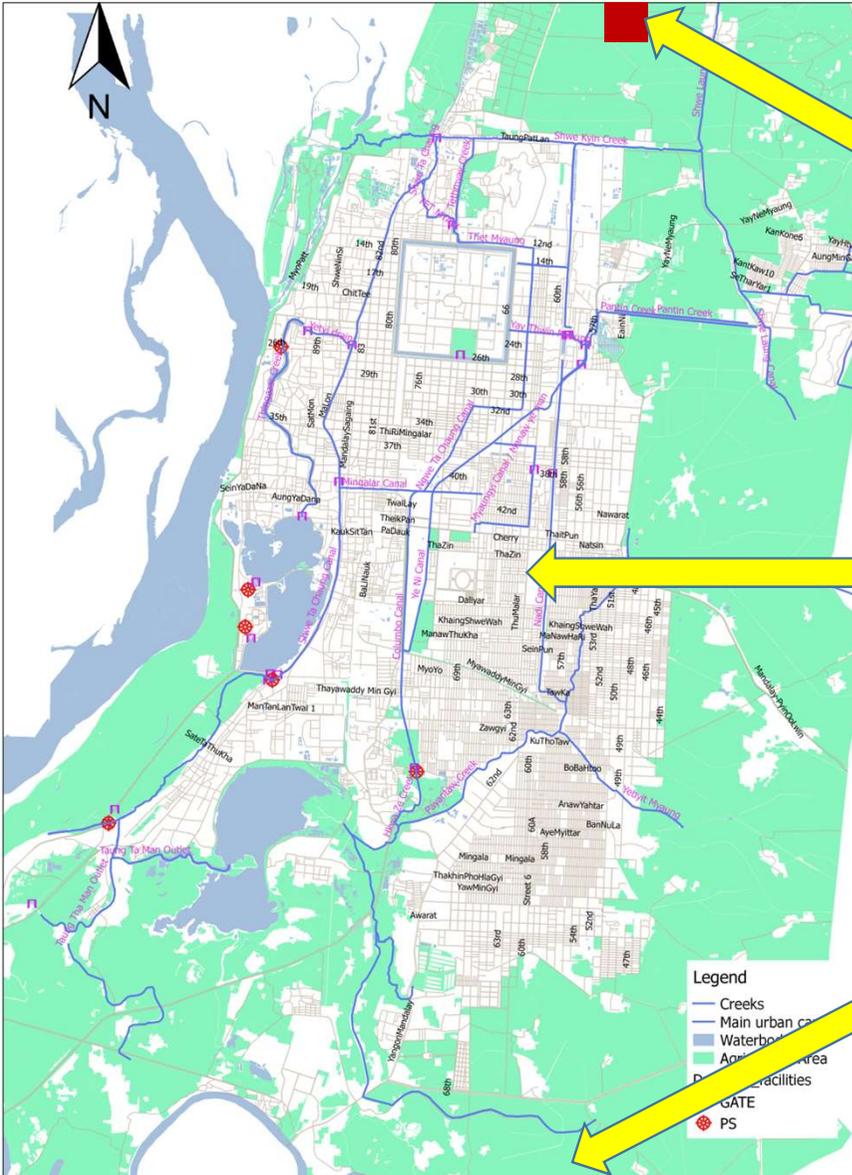
- 1) 62 % septic tank
- 2) 32 % pit latrines
- 3) 6 % open defecation
- 4) No pipe sewage system
- 5) No centralize treatment system
- 6) Emptying sludge by vacuum trucks  
(existing 10 nos + purchasing 10 nos)

No	Model/Made	Nos	Total collection load		Total load (m <sup>3</sup> /month)	
			(m <sup>3</sup> /day)		(22 working days in a month)	
			Minimum	Maximum	Minimum	Maximum
1	Japan	2	4.5	9.1	198	400.4
2	DF Faw	4	4.5	9.1	396	800.8
3	China	4	4.5	9.1	396	800.8
Total		10	45.2	91	990	2002





# Desludging and Oxidation Pond



Location of the Oxidation Pond

Under MCDC Area (6 townships)  
40100 MMK

Uptown MCDC Area  
60100 MMK

## Location

- ✓ 11km from north of Mandalay City
- ✓ Kyar Ni Kan Cemetery

## Pond Size

- ✓ Facultative Pond (200'x100'x6')
- ✓ Aerobic Pond (100'x100'x5')
- ✓ Finishing Pond (50'x50'x4')

# On-site Domestic Wastewater Treatment Project (Jokhasou System) In HninSi Rental Housing



SPECIFICATION MBS-900SP		
Design Flow	900	m <sup>3</sup> /day
Influent BOD	160	mg/Lt
Effluent BOD	50	mg/Lt
Influent COD	400	mg/Lt
Influent pH	7.5	
Influent Conductivity	995	
Influent TDS	544	
Effluent Coliform	400	MPN/100mL

EFFECTIVE CAPACITY		
Equalizing Tank	453.6	m <sup>3</sup>
Sludge Thickner	30.53	m <sup>3</sup>
Sludge Storage	95.04	m <sup>3</sup>
Moving Bed 1 Chamber	114.072	m <sup>3</sup>
Moving Bed 2 Chamber	36.006	m <sup>3</sup>
Sedimentation Chamber	75.057	m <sup>3</sup>
Disinfectant Chamber	1.26	m <sup>3</sup>



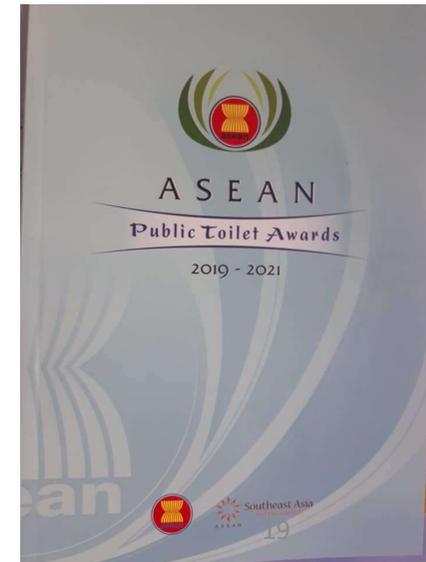
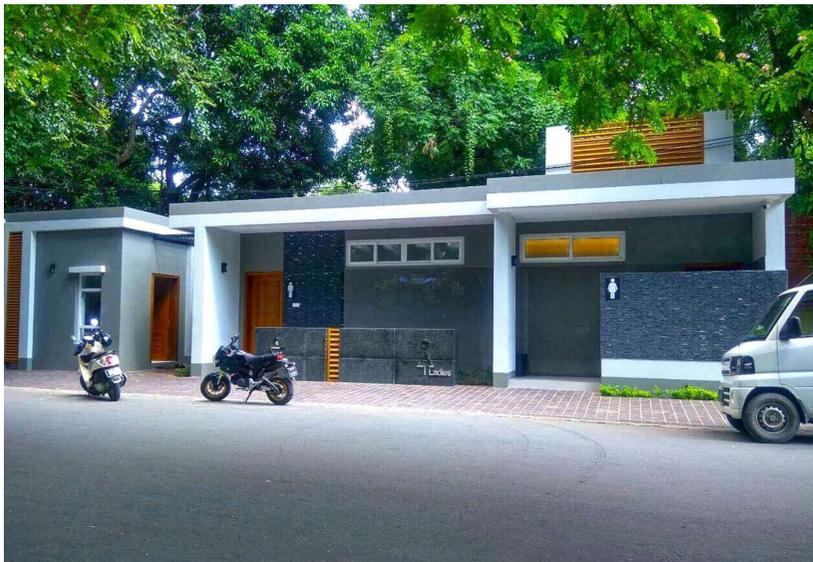


# Public Toilets

# ASEAN Public Toilet Awards 2019 ~ 2021



- 1) Location – 70<sup>th</sup> Street, between 26<sup>th</sup> & 27<sup>th</sup> Street
- 2) Treatment – Johkasou system
- 3) Capacity – 10 m<sup>3</sup> per day
- 4) Demand – average 145 person per day
- 5) Fee – 200 kyats per person



# Public Toilets with Johkasou System





# **Mandalay Urban Services Improvement Project (MUSIP)**

# Mandalay Urban Services Improvement Project (MUSIP)

(Apr 2016- March2023)



ADB loan = **\$60.0 million**



Grant from the Urban Climate Change Resilience Trust Fund (UCCRTF) of **\$4.0 million** administered by ADB

- ❖ MYWW/1.0: Thingazar interceptor
- ❖ MYWW/2.0: ShweTaChaung intercepto
- ❖ MYWW/3.0: ShweGe Pumping Station
- ❖ MYWW/4.0: Nankad Lake WWTP and ancillaries (DBO)



# Current issues



- 1) Budget limitation
- 2) Baseline on sanitation data are not available
- 3) No dedicated department for managing and monitoring on Sanitation and drainage system
- 4) lack of integrated planning based on experience on wastewater treatment
- 5) Inadequate attention has been paid to develop urban sanitation and drainage
- 6) lack of adequate legal and institutional structure to make plans and manage the development
- 7) long-term problem of underinvestment in sanitation infrastructure
- 8) The inadequate attention to social and environmental safeguards for emission guidelines on domestic wastewater



**Thanks**

**For your Kind Attention**

