



Current Status of the Planning of Municipal Wastewater Treatment System
in Myanmar

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Outline

- Background
- Sanitation Coverage
- Current status of Yangon and Naypyitaw City
- Guideline for Wastewater Effluent Quality
- Challenges
- Concluding remarks

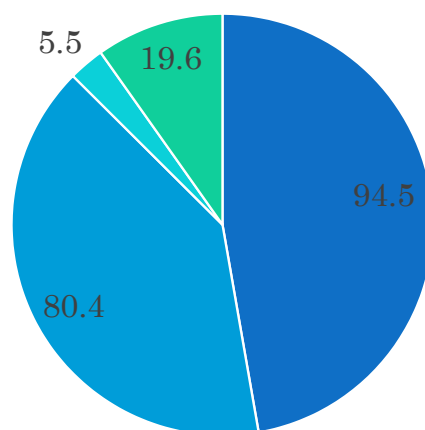
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Background Information

Situated in	-South East Asia
Area	-261,228 square miles -677,000 sq km
Climate	-Tropical monsoon - (3 seasons)
Annual Rainfall	-2500 mm(Delta Region) -1000mm(Dry Zone) -5000mm(Coastal Region)
Average Temperature	-22~40 degrees Celcius
Population	-51.4 millions
Density	-80 per sq km
Administrative	-14 states/regions

Sanitation Coverage In Myanmar



■ Improved Sanitation Facility in urban area
■ Improved Sanitation Facility in rural area
■ Unimproved Sanitation Facility in urban area
■ Unimproved Sanitation Facility in rural area

[Source- Multiple Indicator Cluster Survey(DOH) (2009-2010)]

Related Organizations to Municipal Wastewater Treatment (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 Activated sludge wastewater treatment plant
Mandalay City Development Committee	Mandalay	Septic tank system, Pit latrine with slab
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

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SEWAGE SYSTEM OF YANGON

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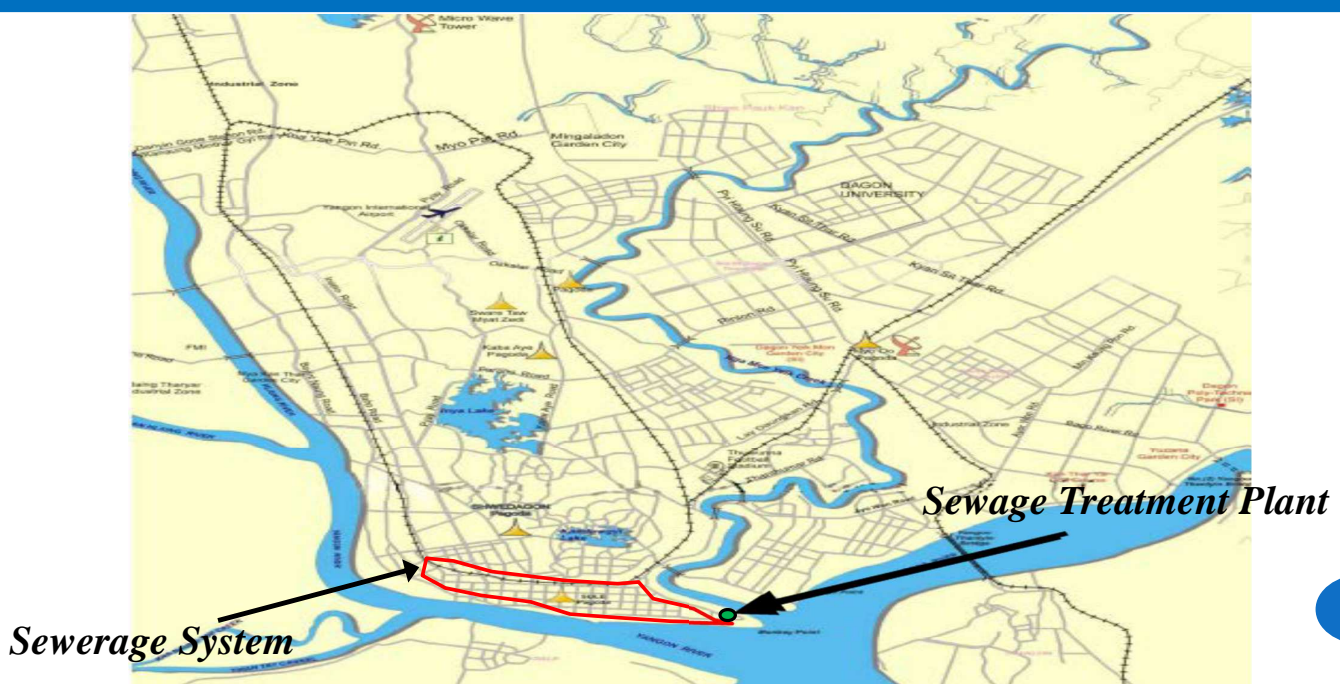
Status of Sewage Treatment in Yangon City

Treatment facility	Percentage of population (%)
Conventional Sewerage System	7.3 %
Septic Tank System	18.4%
Pour Flush System	28.0%
Fly Proof Latrines	18.0%
Unsanitary Latrine	28.0%
No Latrine	0.3%

Source – YCDC

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Situation of Sewerage and Wastewater Treatment Plant in Yangon



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Sewerage System



- Wastewater treatment plant
- Air compressor station
- Total length of sewer pipe line - (10.75) km (12" CI to 36" CI Pipe)
- Sewerage ejectors - (35) Nos

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Disposal of Sewage into the river without any treatment before proposed Sewage Treatment Plant



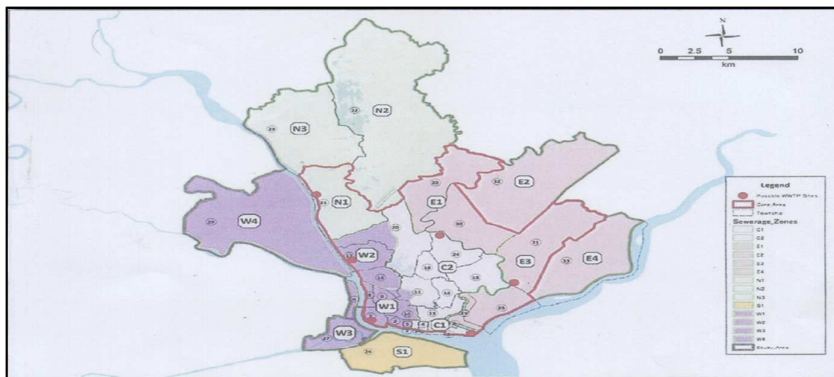
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Activated Sludge Wastewater Treatment Plant



Year of Establishment	- 12 th April 2003
Year of Completion	- 17 th January 2005
Volume of Daily Treatable sewage	- 3.25 MGD
Developer	- Myanmar
Engineers of Yangon City Development Committee	
Cost of Project -	- USD0.96 Millions
+ (Myanmar Kyat -2065.7 Millions)	
Areas of Plant	- 5.56 Acres
Design Criteria:	
Design population	- 300,000
Daily wastewater discharge	- 14775 m ³ /day
BOD influent	- 600mg / l
BOD effluent	- 20-40 mg / l
Suspended solid influent	- 700 mg / l
Suspended solid effluent	- 40 mg / l

Long Term Plan for Yangon City



Population, Wastewater Flow by Sewerage Zones

Sewerage Zone	Population (person)	W. Flow (m ³ /day)		Area (ha)	WWTP Area (ha)	Township
		Daily Ave.	Daily Max.			
C 1	178,127	64,275	70,213	499	6.4	Pazundaung, Botahtaung, Kyauktada, Pabedan
W 1	483,058	134,943	146,552	1,654	10.1	Lamadaung, Latha, Dagon, a part of Bahan, a part of Kyee Myin Daing, Ahlone, Sanchaung, a part of Kamaryut
C 2+E1	1,902,155	659,542	714,184	11,286	27.0	a part of Bahan, Mingalar Taung Nyunt, Tanwe, South Okkalapa, Thingangyun, Yanke, a part of Mayangone, North Okkalapa, North Dagon
W 2	349,512	98,581	106,205	2,356	8.3	Hlaing, a part of Kamaryut, a part of Mayangone
E 3	920,933	196,986	212,652	5,418	12.7	Dawbon, Takaeta, South Dagon
N 1	377,188	95,069	105,613	3,153	3.3	Buxita
E 4	399,111	77,827	83,814	4,202	7.1	Dagon Seikkan
E 2	1,183,320	230,747	248,497	17,064	14.0	East Dagon
N 2	906,748	235,755	253,890	12,783	14.2	Mingaladon
N 3	514,954	100,416	108,140	5,271	3.4	Shwe Pyi Thar
W 4	737,724	143,855	154,921	7,761	10.5	Hlaing Tharyar
S 1	490,032	95,557	102,907	9,840	8.1	Dala
W 3	74,419	24,187	26,047	1,485	3.5	A part of Kyee Myin Daing, Seikgyikhumaungto
Out of SZ	2,241	582	627	117	1.17	Seikkan
Total	8,519,522	2,161,322	2,334,262	82,899	138.6	

SEWAGE SYSTEM OF NAYPYITAW

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EXISTING SEWERAGE SYSTEM IN NAY PYI TAW

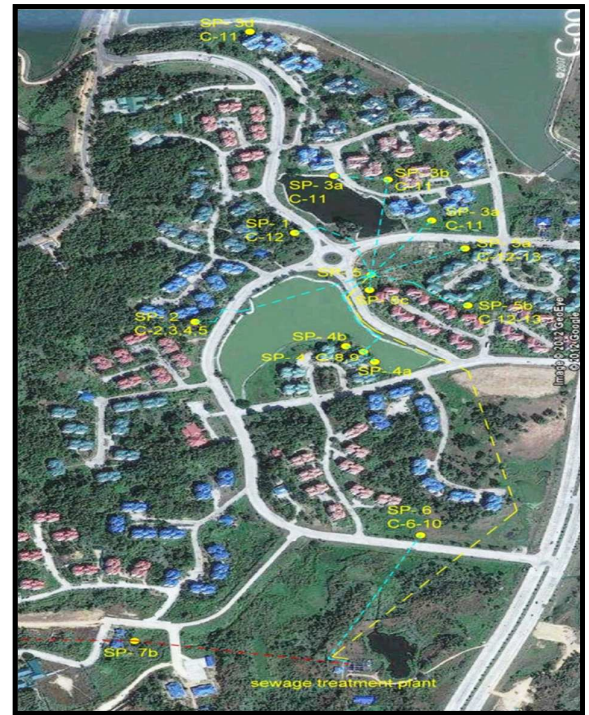
- 20% of new constructed area of Nay Pyi Taw using sewage treatment plant (Aerobic System)
- 80% using Septic Tank (Anaerobic System) and Pit Latrine with slab
- Sewage collection is combined system
- Sewer pipes are directly connected with waste water treatment plant

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Using Sewage System w.r.t Quarter

Sr	Quarter	Population	Sewage System
1	Mingalr Thaikdi	5972	Central System
2	Bawaga Thaikdi	5252	Separate System
3	Pyinyar Thaikdi	8239	Separate System
4	Zayya Thaikdi	3700	Separate System
5	Dana Thaikdi	7994	Separate System
6	Bala Thaikdi	7632	Separate System
7	Nyarna Thaikdi	8537	Separate System
8	Thuka Thaikdi	5548	Separate System
9	Wanna Thaikdi	8915	Separate System
	Total	61789	

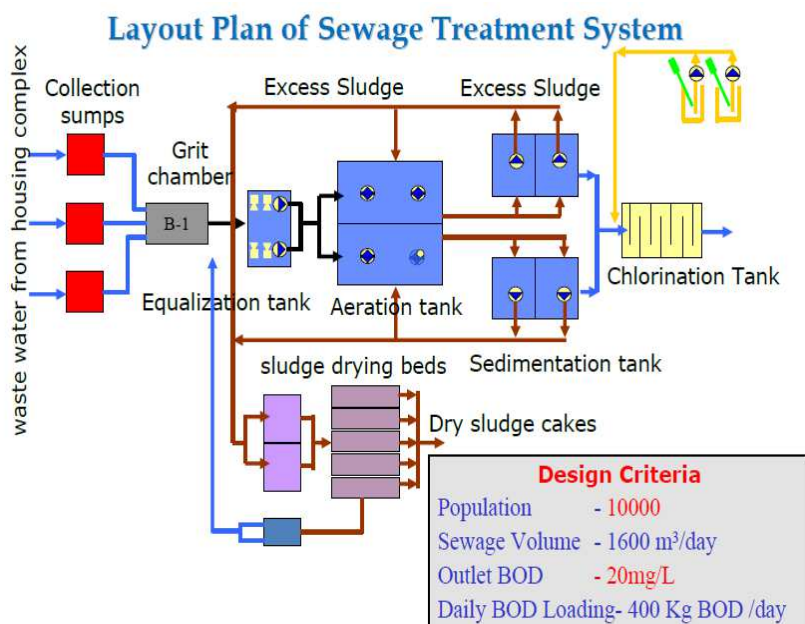
Source – NCDC



SEWAGE SYSTEM OF NAYPYITAW MINGALARTHAIKDI QUARTER

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Activated Sludge Process



Influent Quality

Biochemical Oxygen Demand (BOD,20°C)	250mg/lit
Suspended Solids (SS)	220mg/lit
Total Organic Carbon (TOC)	160mg/lit
Chemical Oxygen Demand (COD)	500mg/lit

Effluent Quality

Biochemical Oxygen Demand (BOD,20°C)	20mg/lit
Suspended Solids (SS)	30mg/lit
Chemical Oxygen Demand (COD)	60mg/lit

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SEWAGE TREATMENT PLANT IN NAYPYITAW



GRIT CHAMBER (INLET OF SEWAGE TREATMENT PLANT)

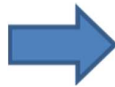


AERATION TANK OF SEWAGE TREATMENT PLANT

EQUALIZATION TANK FOR SEWAGE COLLECTION



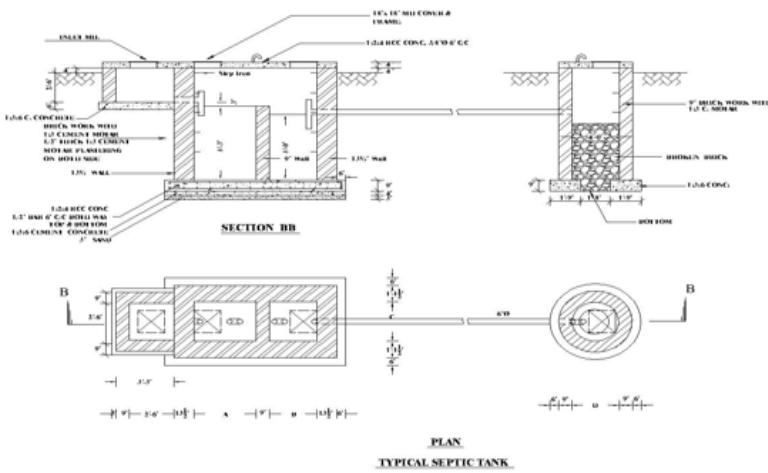
AERATION TANK



TREATED WATER COLLECTION OR RETENTION POND



Decentralized Wastewater Treatment System in Myanmar Septic Tank and Soak Pit



Comparison of Septic Tank System

	Conventional Septic Tank	Jokasou	Sewage Treatment Plant
For	Black Water	Black & Gray Water	
Process	Anaerobic + (Under Seepage)	Anaerobic + Aerobic	
Treated water (BOD)	100-150 mg/l	<20 mg/l	20-50 mg/l
Construction Period	Short	Short	Middle
Electricity	No Need	Need	
Administrator	Homeowner (Individuality)	Individual or Municipality	Municipality
Suitable area	Area of scattered population	Area of scattered population	Urban area

**COMMITTEE FOR QUALITY CONTROL OF HIGH-RISE BUILDING
CONSTRUCTION PROJECTS
GUIDELINE III
GEOTECHNICAL INVESTIGATIONS RELATED TO SANITARY WORKS**

1. To provide bearing capacity of soil at site of construction, where required, for the design and construction of reservoirs, water treatment plant and waste water treatment plant. (M)
2. To provide information on the type of soil at site of construction, preferably with respect to the AASHO soil classification. (R)
3. **To provide result of Percolation Test where required. (R)**

Sanitation (CQHP Guideline)

Sanitation

1. Spent Water (R)

1-1 Spent water contribution should be based on water demand as given in para. 1-1, Guideline IV. It is recommended that at least 90% of the water consumed will be discharged as spent water.

1-1-1 Spent water consists of soil and waste water. Table 1, Appendix (R)

1-1-1-1 **Soil water** is the spent water from WCs and urinals.

1-1-1-2 **Waste water** is the spent water from basins, kitchen sink, and bath rooms.

2. Soil Water Treatment and Disposal (M)

2-1 Soil water shall be treated before being discharged into a water course or public drain.

2-2 The effluent quality of the treated soil water shall conform to the following:

BOD 50 mg/l (maximum)

COD 100 mg/l (maximum)

SS 50 mg/l (maximum)

2-3 Soil water discharged into YCDC sewer shall be treated to the following effluent quality:

BOD 150 mg/l (maximum)

COD 200 mg/l (maximum)

SS 150 mg/l (maximum)

Note : BOD value refers to 5-day incubation period at 20° C.

2-4 A permit shall be obtained from Pollution Control and Cleansing Department, YCDC, for the discharge of treated soil water.

2-5 Effluent of treated soil water shall be disinfected with chlorine or by any other approved method where required.

2-6 Where effluent is chlorinated, the residual chlorine shall be between 0.0 and 0.1 mg/l.

3. Waste Water Disposal

3-1 Waste water from residences may be discharged directly into public drain. (R)

3-2 However, waste water from kitchen sinks of restaurant shall first be discharged into a grease trap before its disposal into public drain. (M)

3-3 Waste water is prohibited from being discharged into YCDC sewer.(M)

3-4 A permit shall be obtained from Pollution Control and Cleansing Department, YCDC, before waste water is disposed of into public drain. (M)

Challenges

- Sanitation activity is not yet priority
- Weakness in water and sanitation sector are limited manpower and technical supporting
- Budget limitation
- Difficulty in the change of awareness to practice among communities
- Less Sustainability due to low cost technology

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Concluding Remarks

- Myanmar has reasonable coverage for sanitation
- Capacity development for key players such as water professions from different agencies, users, local authorities stakeholder, is prerequisite, so that all stakeholders need to encourage integrated approach, help in addressing other sector problems
- To set up the Subsidy system for homeowner leading to appropriate wastewater treatment system
- So, law enforcement is also essential for implement more comprehensive formation of municipal wastewater treatment and could be more effective and useful for the country

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**THANK YOU
FOR YOUR TIME & INTEREST**

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