



Water and Sanitation, Waste Hygiene and Public Health: in the Context of Co-existence with COVID-19

水・公衆衛生・廃棄物 ～コロナとともに生きるために～

UN-Habitat Myanmar

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COVID 19 OUTBREAK PATTERN IN MYANMAR

ミャンマーにおける新型コロナウイルスの拡大

- ❑ Cities are the hot spots of COVID 19 out break also in Myanmar
 - ❑ Total confirmed Cases: 138,368
 - ❑ Total recovered : 122,781
 - ❑ Total deaths among laboratory confirmed cases: 3,082

ミャンマーでは都市を中心に感染が拡大： 感染者138,368人、回復した人122,781人、確認された死者数3,082人

- ❑ 70% of cases in Yangon Region and of that 77% in the city.
- ❑ Mandalay City, - Second city
- ❑ Rakhine State- Air Travel, mobility of people
- ❑ Other Region: low number and low increase rate: time lag- Largely Rural Characteristics.
- ❑ Poor and Vulnerable are impacted the most

- ・国内感染の70%はヤンゴン地域、うち77%はヤンゴン市内
- ・第二の都市マンダレー
- ・ラカイン州：空の交通、人々の移動
- ・他の地域：感染者は少なく増加率も低い
- ・低所得層や脆弱な人たちがもっとも打撃を受けている

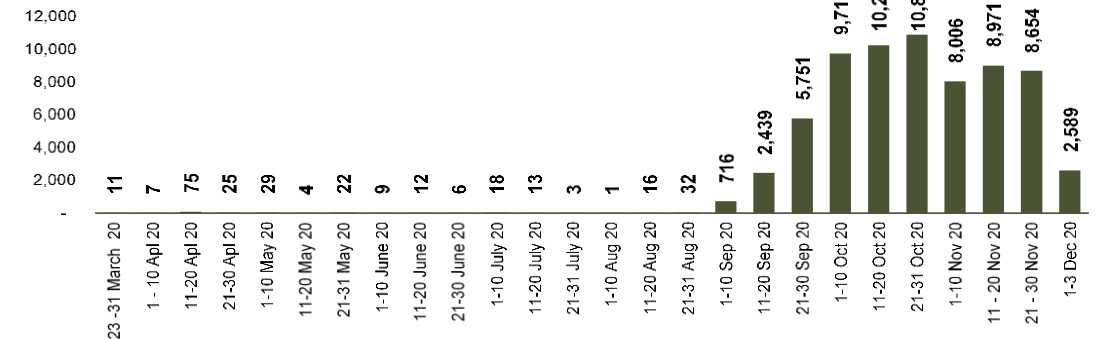
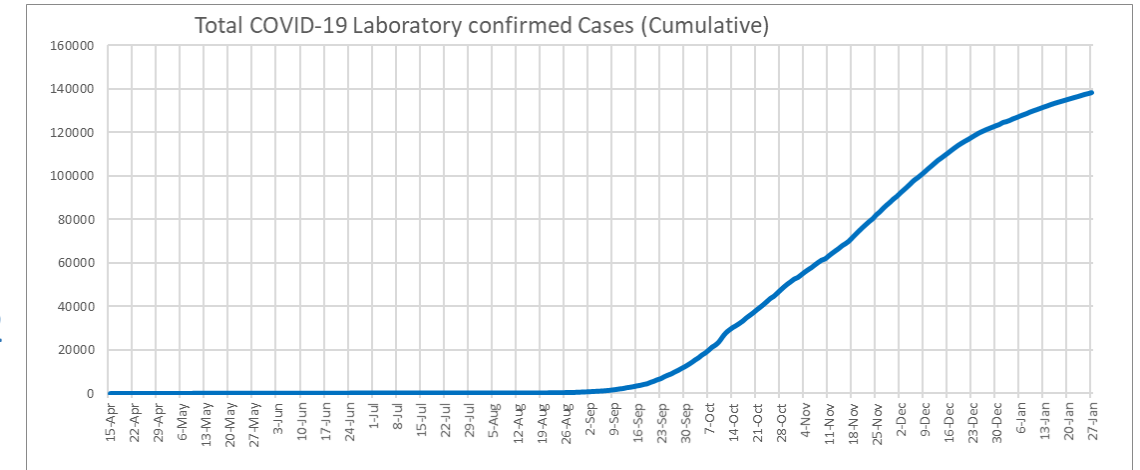


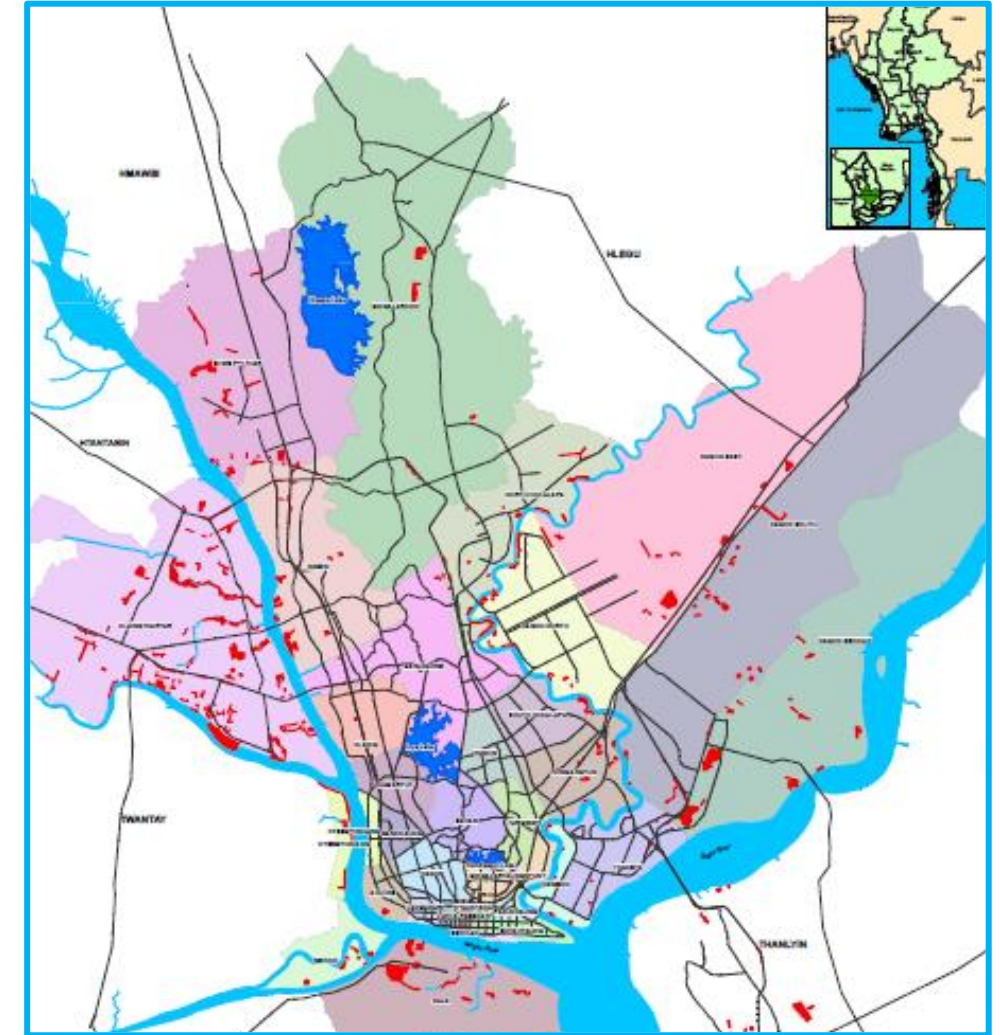
Fig. 1.2 Total COVID-19 laboratory confirmed cases in Yangon (Cumulative 23 March – 2 Dec 2020)
Source: Ministry of Health and Sports

COVID 19 OUTBREAK PATTERN IN MYANMAR

ミャンマーにおける新型コロナウイルスの拡大

- ❑ Myanmar 30% Urban, Yangon City 4.2 million people
- ❑ Yangon has 423 pockets of informal settlements, mapped in 2016, 85000 HH 400000+ people
- ❑ Densely Populated, Devoid of Basic Services,
- ❑ prevention measures: Hand Washing, Use of Mask, Social Distancing, Home Quarantine, Isolation not a reality.
- ❑ Risk of spread remains

- ・ミャンマーは都市化率30%、ヤンゴン市人口は420万人
- ・ヤンゴン市内には423か所8万5世帯40万人の非正規の集落がある
- ・集落は過密で基本的なインフラサービスがない
- ・予防策としては、手洗い、マスクの利用、ソーシャルディスタンス、自宅で検疫などだが隔離は現実的には無理
- ・感染拡大リスクはまだ高い



UN-Habitat Myanmar- Response Measures

国連ハビタットミャンマー事務所によるコロナ対策

UN-Habitats Response Measures:

We have highlighted in our advocacy paper on housing released in May 2020, along with water and sanitation, **housing, is at the forefront of the battle against COVID-19.**

国連ハビタットが2020年5月に発表した報告書で、水・衛生ともに住まいがコロナとの闘いには重要と指摘

Water, Sanitation, Hygiene, Health and Awareness 水・衛生・公衆衛生や意識喚起

- **Awareness raising and information dissemination**
注意喚起と情報の普及
- **Expand access to water** through installation of water systems, hand washing stations
給水設備や手洗い所の設置による水へのアクセスの拡充
- **Supply of basic needs to vulnerable communities** including masks, soaps and sanitizers
マスク・石鹸・除菌剤等基本的ニーズ品の脆弱なコミュニティへの提供
- **Support Health facilities** isolation and quarantine facilities for those unable to quarantine or treat themselves at home.
隔離・検査などを自力でできない人々のための保健施設の提供
- **Enhance, SWM, Waste collection, Disposition,**
廃棄物の管理、回収、処分等の改善
- **Improve Environmental sanitation**
環境衛生の改善

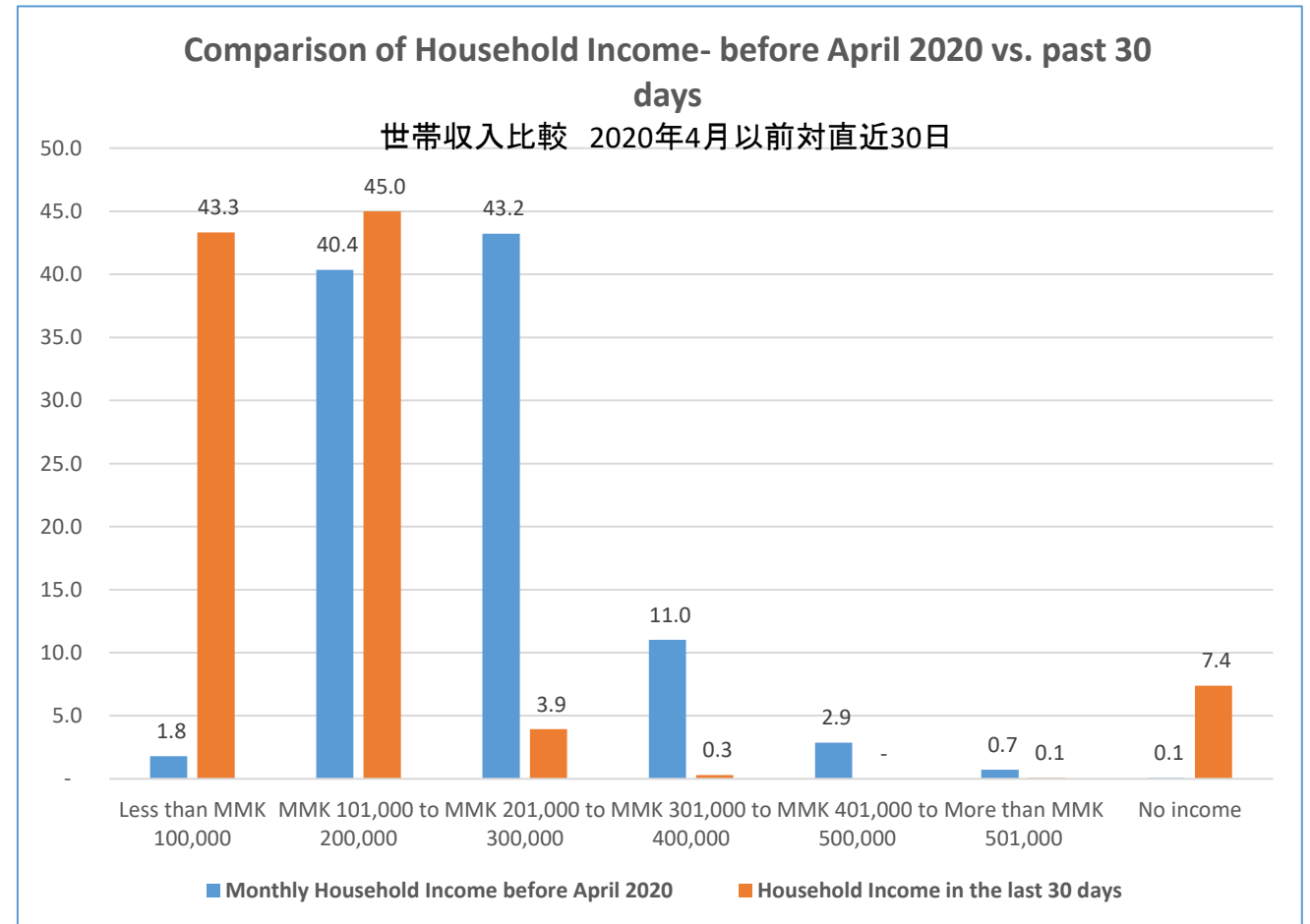


Differentiated Impact on Urban Poor

コロナが都市の低所得層に及ぼす様々な影響

- **Survey sample: 1680 households residing in informal settlements**
調査サンプル: 非公式集落に居住する1680世帯
- **Steep Fall in Household Income: as low as 76 USD per month/ Household**
世帯収入の激減: 最大76%減
- **Pervasive Job loss: In the past 90 days, 88.1% of all households in the sample reported at least one member losing their job.**
直近3か月にコロナによって少なくとも88%の世帯の1人が失業
- **Increase in Household loan: 73.4% of households took out a loan to purchase food. Repayment of existing loans (25.4%) and health expenses (19%) were the other top reasons for borrowing.**

少なくとも73.4%の世帯が食糧を買うために借金をした。借金の理由は、コロナ以前に別のローンを抱えていた人が25.4%、医療費があったためと答えた人が29%



Issues related to Water and Sanitation, Waste Hygiene and Public Health

水・衛生・廃棄物・公衆衛生分野における課題

- Access to adequate and safe water at the places of need: including informal settlements
- Lack of awareness to Sanitation and Hygiene
- Incomplete Solid Waste Collection and Management
- Absence of Waste Segregation
- Limited recycling, reuse, renew
- Absence of Sewerage network Across the city
- Absence of Basic Services: Housing, water supply, Sanitation, Latrine, Waste Collection,
- Limited Capacity of National Health System

安全で適切な水のアクセスの必要とされる人と場所での確保、衛生や公衆衛生への注意の不足、不完全な廃棄物回収と管理、廃棄物の分別が行われない、3Rの欠如、下水ネットワークの欠如、基本サービスの欠如、国民保健システムの不足

UNITED NATIONS HUMAN SETTLEMENTS PROGRAMME MYANMAR



Solid Waste Management, Sewerage: Current Sewerage System in Yangon

ヤンゴンにおける廃棄物管理と下水の状況

- **SWM: Collection and disposal system exists for collecting 60% of Waste:**
廃棄物の60%は回収されている
- **Sewerage Management:**
 - Centralized Wastewater Treatment Plan for Central Business District CBD
 - Stand Alone – Wastewater treatment Systems
 - Ongoing projects of improvement of sewerage drainage systems from CBD
 - Septic Tank system for low-risk building types
 - Hi Rise and High-risk building- waste treatment system
 - Decentralized Wastewater Treatment System by Johkasou in Yangon-3
 - Myanmar National Building code provisions for – big buildings, industries and commercial installations
 - Discharge to Natural Drainages course to rivers, ponds as well as stagnant sewer water



下水管理の状況:

中心業務地区では集中下水処理システム計画、スタンドアローンのシステム、既存システムの改善計画、低層低リスク建物での浄化槽システム、高層高リスクビルでの下水処理システム、ヤンゴン3区での分散型浄化槽下水処理システム、ミャンマー国建築基準法などの計画・実施、また自然河川・湖水への下水放流などの課題



Current Sewerage System in Yangon

ヤンゴンにおける下水システム、

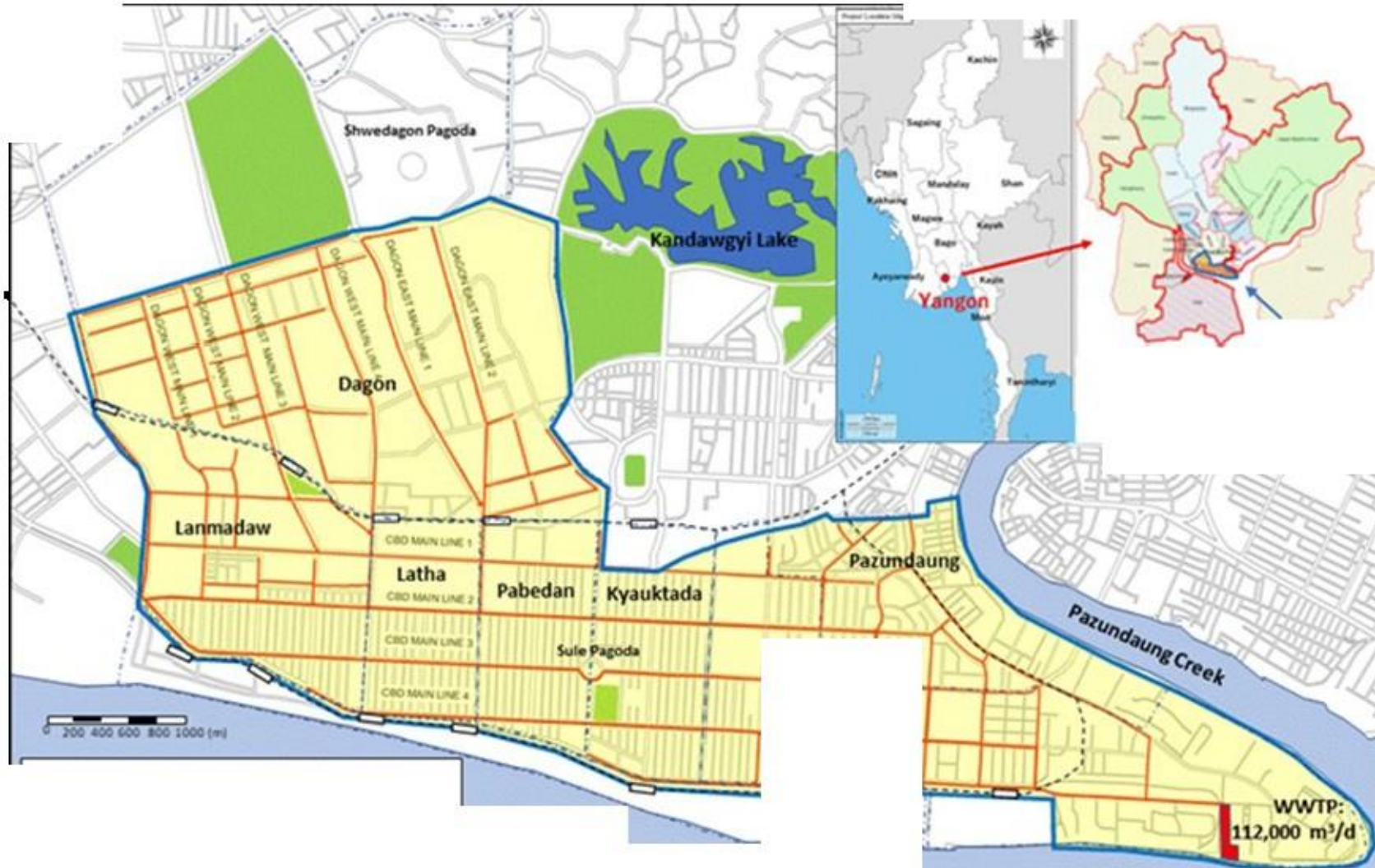
WWTP by Conventional Sewerage System (In CBD)

中心業務地区における既存の下水処理施設



Current Sewerage System in Yangon

ヤンゴンにおける下水システム



**On-going Project for
Sewerage System in CBD
Area: 3 packages of
construction**

中心業務地区で下水プロジェクト実施中

**Sanitation Management
Master Plan Until 2040
by Management Zones**

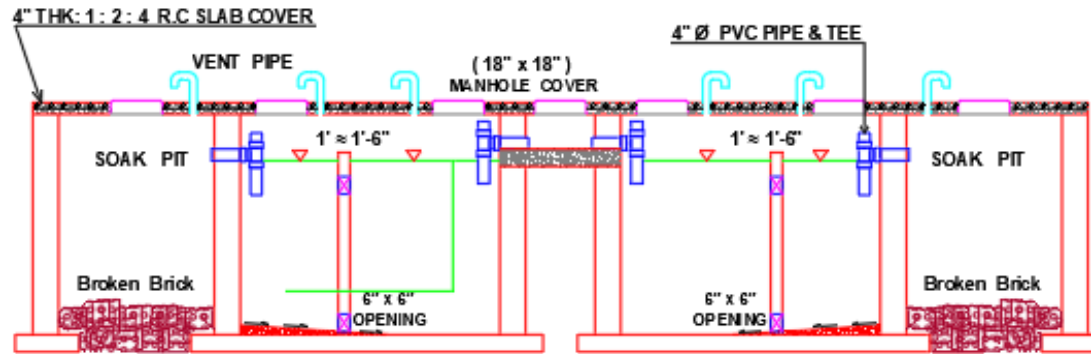
2040年衛生管理マスタープラン

Septic Tanks in Low rise and Medium Rise Buildings

低層中層の建物における浄化槽

Septic tank system (Residential Building) - Low Risked Building Type

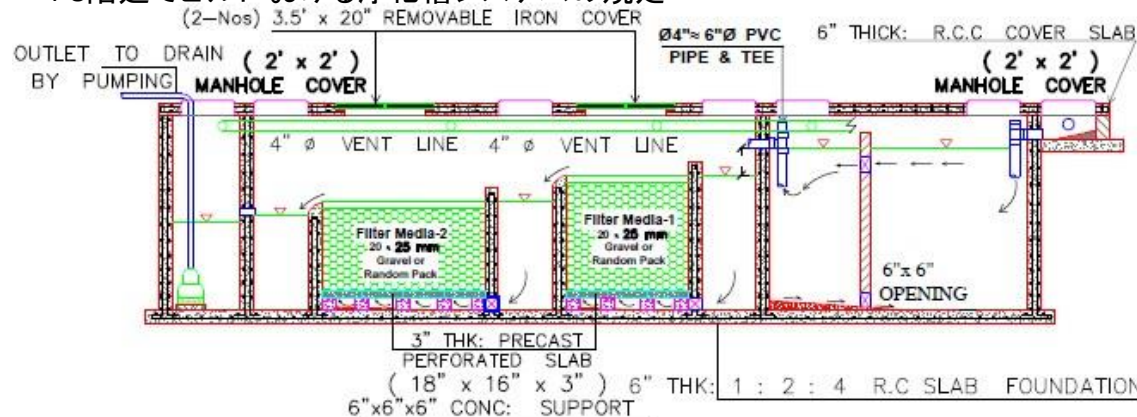
住宅用低層ビルにおける浄化槽システム の規定



- Up to 3-storeyed residential building is allowed to use septic tank with soak pit, but up-flow system is also allowed to be used.

Septic tank with up-flow system (4 to 8-storeyed Building) - Medium Risked Building Type

4-8階建てビルにおける浄化槽システムの規定



- 4-storeyed to 8-storeyed residential buildings need to have treatment unit at least up-flow system. But, septic tank with soak pit is not allowed
- Any types of Aeration Treatment system is allowed with respect to stipulated guidelines

High Rise and High Risk Building Types

高層ビルにおける下水システムの規定

- **High-Rise Buildings over 8-storeyed** need to have aeration treatment unit with respect to the stipulated guidelines. 8階建て以上のビルには曝気装置が必要

- MBR/MBBR



- Aeration method must be used, Membrane Bio-reactor (MBR) is one of aeration method.
- Sometimes, Moving Bed Biofilm Reactor (MBBR) is also used as aeration method

Design Criteria

- Influent – 250 mg/l and effluent – 20mg/l in BOD
- Over 250 mg/l – change interior treatment process or insert the pre-treatment to reduce BOD concentration
 - System can be adjusted for aerobic system, anaerobic system and the mixed system

- Johkaou



- Location : YCDC Staff Training School
- Capacity : Max 10m³/day



- Location : Night Market (Merchant Road)
- Capacity : Max 20m³/day

Decentralized Wastewater by Johkasou in Yangon-1/ Yangon2 : Factories and Residences

ヤンゴン1区2区の工場や住宅地における浄化槽を使った分散型の下水処理システム

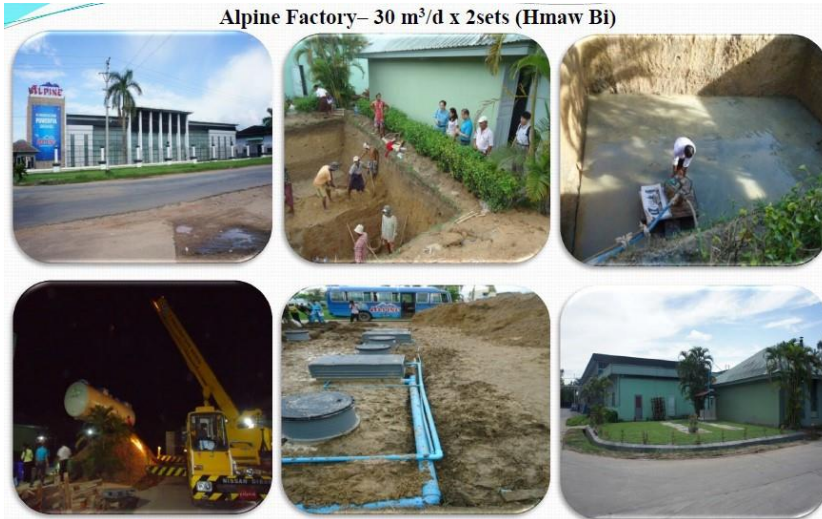
Strand Square Office Tower (150) m³ / d (Yangon)



River View Condo (AMCD) – 100 m³ / d x 2sets (Yangon)



Alpine Factory – 30 m³/d x 2sets (Hmaw Bi)



Asia Metal Company – 1m³ , 2m³, 4.2m³ & 10m³ x2sets (Yangon)



Decentralized Wastewater by Johkasou in Yangon-3

ヤンゴン3区における浄化槽を使った分散型の下水処理システム

2013	January	YCDC	10m ³	USD 10,000
2014	March	Phaung Daw Oo Pagoda	6m ³	USD 7,500
2014	May	MCDC	10m ³	USD 10,000
2016	December	Information Center	1m ³ (5 sets)	USD 12,450
2017	January	Nyaung Shwe (Night Market)	3.6m ³	USD 6,400
			Total	USD 46,350



2017	September	Shwe Dagone Pagoda (East, West, South, North)	41m ³	USD 100,000
			Total	USD 100,000



Decentralized Wastewater by Johkasou: 23 Storied Building Inspection.

浄化槽を使った分散型下水処理システムの検査



Key Challenges in the informal settlement areas

非公式集落(不法集落)における主な課題

1. Stand Alone System of Sewerage Collection. Evacuation and transport to treatment plan.
2. Small scale treatment plan ? Cost Effective?
3. What kind of septic tank or design suitable for low water table (water-logged) areas?
4. Zohkasou system – suitable for such areas

1. 独立型の下水システム(回収、運搬、処理まで)が必要。2. 小規模のシステムがよいのか？コスト効果は？ 3. 低地湿地帯の集落にはどのようなデザインが適しているのか？4. 浄化槽が適しているのか？



UN-Habitat Plan to Protect Poor and Vulnerable in Informal Settlements

非公式(不法)集落や低所得の人々を守るための国連ハビタットの事業計画

- ❑ New Project Go Japan Funding :
- ❑ 8 Townships: Hlaing Thar Yar, Dagon Seikkan, Dala, Shwe Pyi Thar, North Okkalapa, Thanlyin, Insein townships and South Dagon
- ❑ Target Beneficiaries: 25000 HH, 102500 people
 - ❑ 90 School; 76500 Students
- ❑ COMPONENT A: Enhancing access to safe water and improved environmental sanitation in informal settlements
- ❑ COMPONENT B: Improving solid waste management in informal settlements
- ❑ COMPONENT C: Improving hygiene awareness and capacity of communities in informal settlements
- ❑ 22 Water Supply Systems, HWS at communities and Schools SWM, Awareness, Information, Communications.

日本政府支援事業:

-8つの町が対象・25,000世帯訳102,500人対象・学校90校生徒76,500人対象

-活動内容(予定)①安全で清潔な水と衛生設備へのアクセスの向上 ②非公式集落における廃棄物管理の改善 ③非公式集落のコミュニティを対象とした公衆衛生の普及・

-給水システムの設置やコミュニティ・学校単位のゴミ施設・知識普及や注意喚起の実施

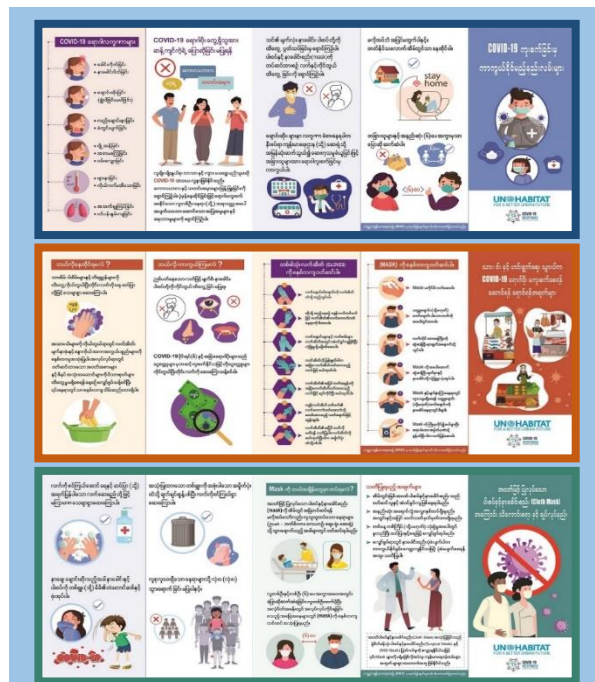
from the People of Japan



Informal settlements in Dala



Water Treatment Plant in Shwepyithar



Covid-19 IEC Materials



SWM project in Htein Bin



Hand-washing station in Shwepyithar

Thank you!

For more information, please visit

さらに詳しい情報をご覧になりたい場合は、下記国連ハビタットミャンマー事務所HPやfacebookをご参照ください。

UN-Habitat Myanmar website: www.unhabitat.org.mm

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