



# **Initiatives to achieve clean cities in Bangladesh**

**- Cooperation for Waste Management and Air Pollution Control, based on Japanese strengths-**

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JICA

# Realize a Clean City in Dhaka and Chattogram

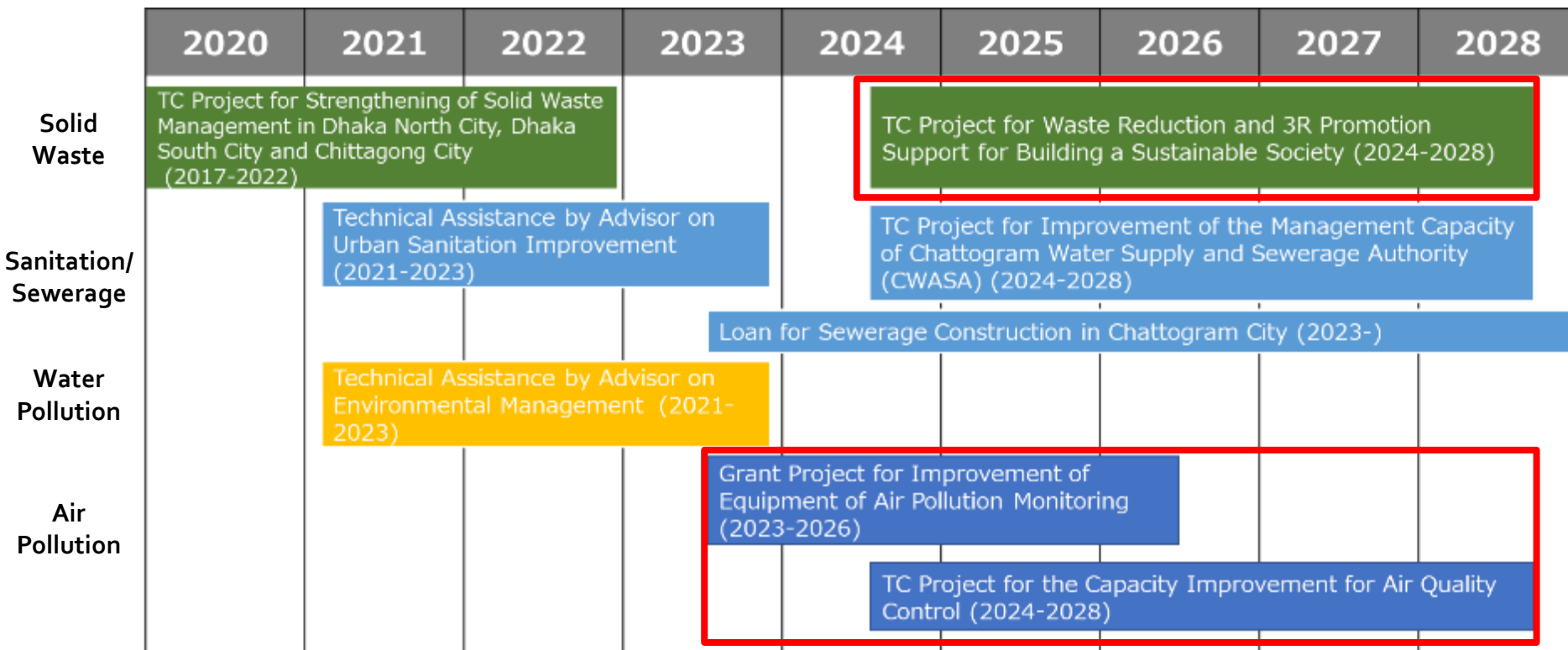
- Management of **Pollution Problems**
- **Harmonization and share Info** among **Central & Local Gov'ts (municipalities)** , and **Public**
- Qualified technologies/products of **private sector**
- **Innovative measures** (e.g. DX) including "Leap Frog" technology
- **Leadership and vision**

Clean City in Bangladesh  
(Dhaka and Chattogram)

Solid  
Waste

Water  
Pollution

Air  
Pollution



TC: Technical Cooperation

# Main actors to Realize a Clean City



## Collaboration among Central & Local governments

Ministry/ Department  
in charge of  
Local Government

Ministry/ Department  
in charge of  
Environment

Ministry/ Department  
in charge of  
Infrastructure,  
Energy,  
Transportation,  
Science & Tech.,  
Investment, etc.

City Corporations  
& Municipalities

**Solid Waste**

Master Plan Development,  
Collection & Transport,  
Final Disposal etc.

Information Aggregation,  
3R promotion etc.

Attracting private  
investment (Intermediate  
Treatment etc.)

Solid Management Rules (2021)

**Air Pollution**

Control Measures  
Implementation

Monitoring & Analyzing,  
Strategy & Policy Making

Control Measures  
Implementation

Air Pollution Control Rules (2022)

# Clean Dhaka Project on solid waste management

Development Study (2003-2006) for 'Clean Dhaka Mater Plan 2005-2015'

Technical Cooperation Project (2007-2013)

- ✓ Establishment of Waste Management Department
- ✓ Improvement of waste collection system
- ✓ Improvement of disposal sites
- ✓ Public awareness and public involvement

JICA Volunteers (2006-2016)

- ✓ Environmental education

Grant Aid Project (2009-2010)

- ✓ Provision of 100 waste collection vehicles

Debt Cancellation Fund (2005-2010)

- ✓ Improvement of 2 dumping sites

Grassroots Grant Aid Project (2006)

- ✓ Provision of a medical waste incinerator

2<sup>nd</sup> Technical Cooperation Project (2017-2022)

- ✓ 'Clean Dhaka Maser plan 2018-2032' preparation in South & North Dhaka
- ✓ Waste segregation pilot project
- ✓ Introduction of detachable rickshaw vans
- ✓ WBA implementation

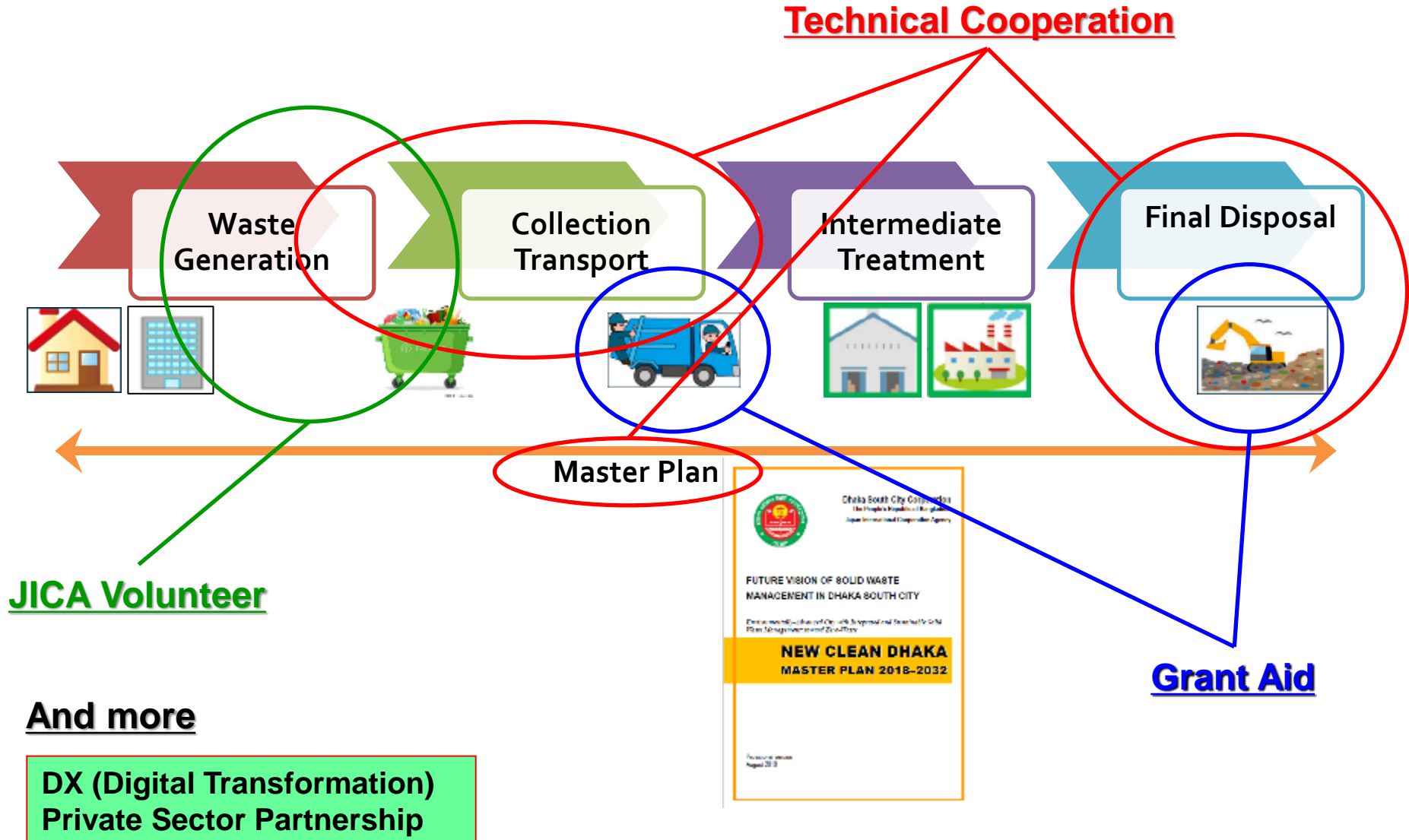
2<sup>nd</sup> Grant Aid Project (2015-2018)

- ✓ Provision of 150 waste collection vehicles
- ✓ 12CC information sharing meeting
- ✓ Support to Chattogram City Corporation (CCC)

3<sup>rd</sup> Technical Cooperation Project (2024-2028)

- ✓ Focus on Waste Reduction and Sustainable Society Building

**DX, Innovation, PPP**



# (1) Improvement of Waste Collection

Waste collection rate improved significantly

44% (2004) → 85% (2021)

in Dhaka

Before

After



Business Opportunity

DX: GPS-based waste collection vehicle tracking system

- Waste collection vehicles for regular fixed point collection
- Installation of Compactor, Container Carrier, and Dump Truck

photo: © Yachiyo Engineering Co., Ltd.

# (2) Improvement of Final Disposal Site

Open dumping sites  
 ✓ No soil cover  
 ✓ Leachate to the access road



Sanitary landfill sites  
 ✓ Soil cover and gas ventilation  
 ✓ Proper leachate collection & treatment

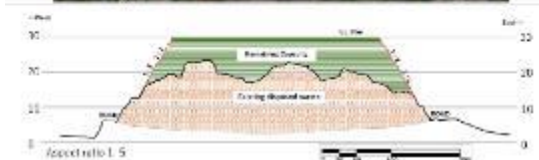
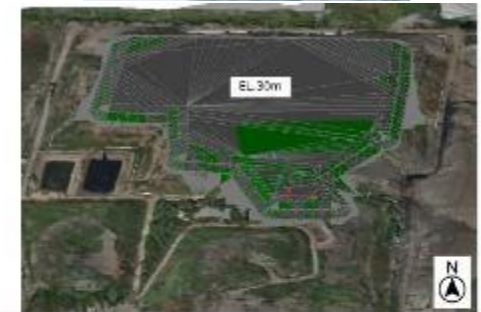
in Dhaka

**DX:**  
 Landfill volume analysis by drone

Before



After



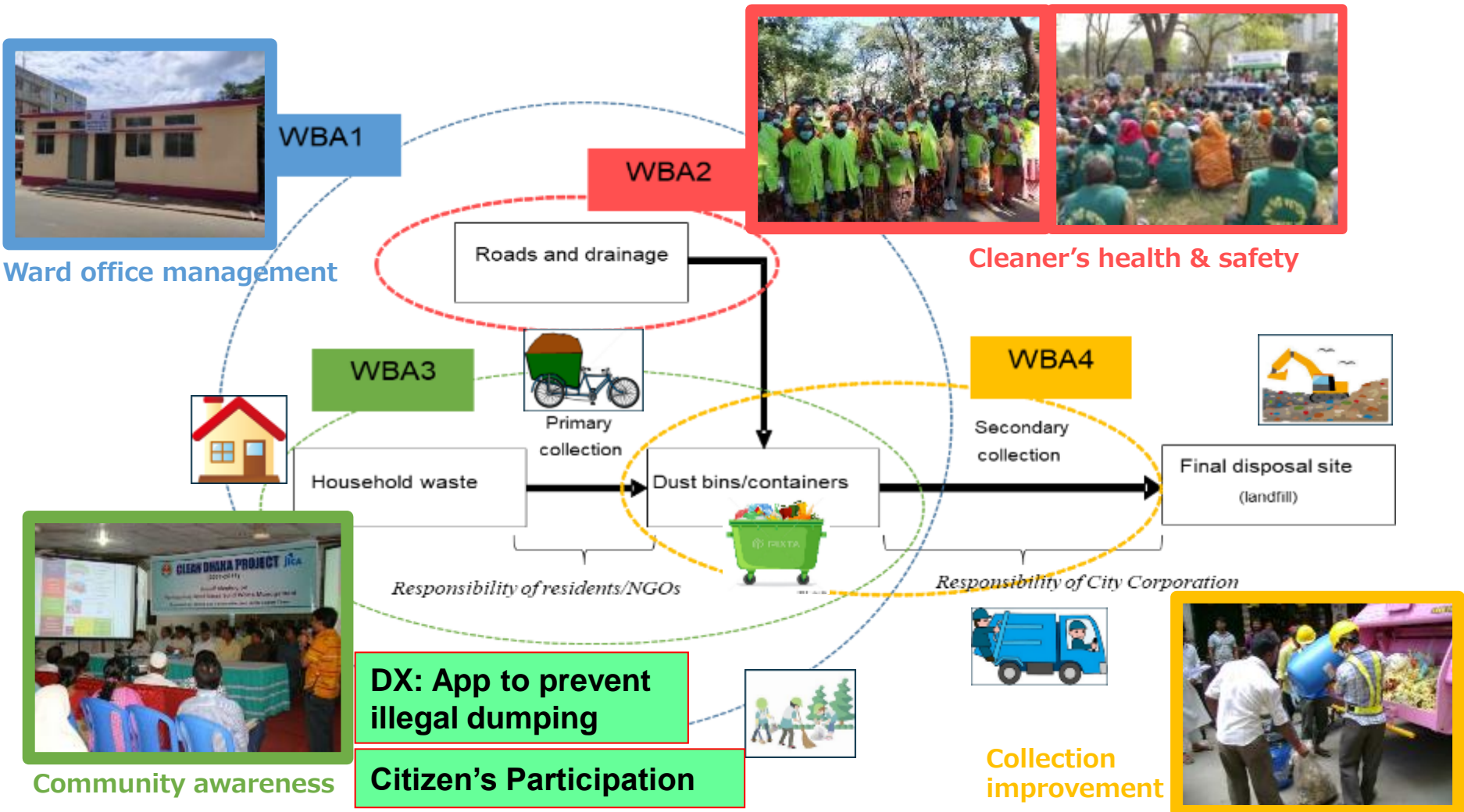
- Capacity development for operation and maintenance of landfill sites.
- Using drones to calculate the remaining life of existing landfill sites.

# (3) Participatory Waste Management

## Ward-based Approach (WBA)

photo: © Yachiyo Engineering Co., Ltd.

1. Construction of ward SWM office
2. Training for cleaning staffs
3. Public awareness raising
4. Regular fixed point collection



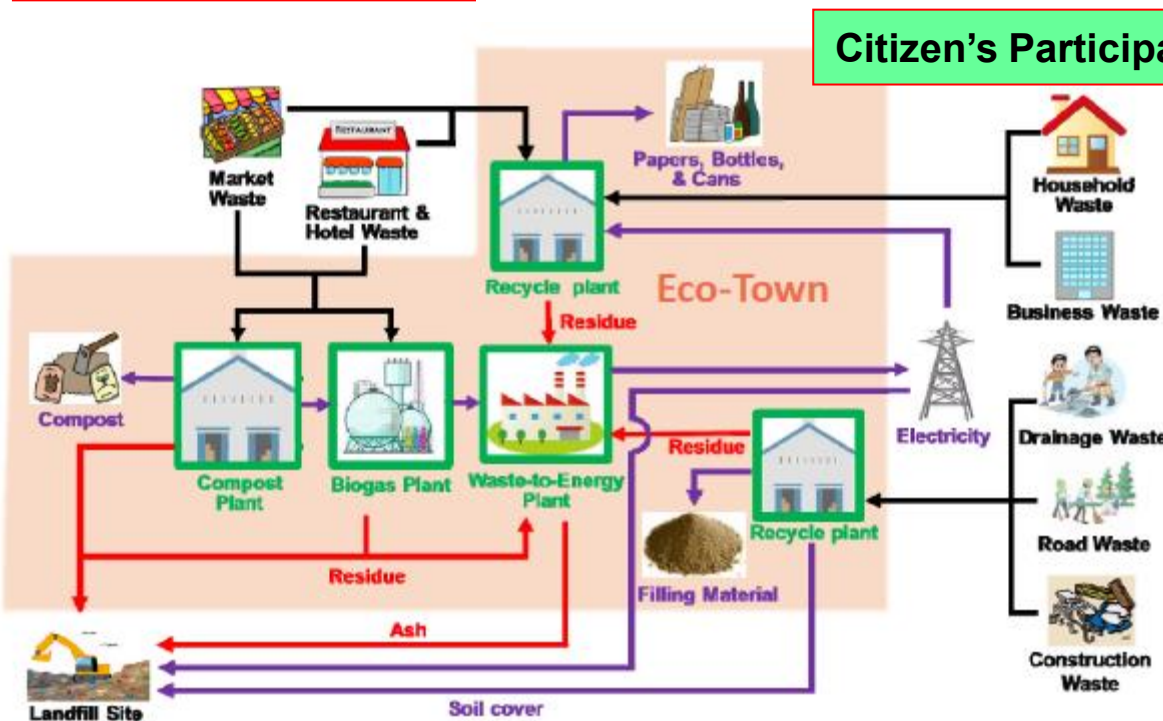


# (4) Intermediate Treatment, Recycling

Realization Eco-Town Scenarios (WtE, composting, recycling etc.) and Installation of medical waste incinerator

Business Opportunity

Citizen's Participation



Business Opportunity




**Chattogram Medical Waste Incinerator**  
(from the people of Japan)

**Outline of Incinerator**

Item	Description
Incinerator type	Water cooled furnace and Smokeless
Incinerator capacity	200 kg/hour (4.8 t/day)
Operation time	24 hour (3 shifts x 8 hour)
Receiving waste type	Medical waste (Infectious and Sharp)
Waste receiving source	Hospital and Clinic of Chattogram
Gas emission standard	Meet Japanese standard

Project for Strengthening of Solid Waste Management in Dhaka North City, Dhaka South City, and Chittagong City



Development of intermediate treatment facilities in line with the Eco-Town scenarios of the Waste Management Master Plan.

Installed medical waste incinerator in Chattogram

## Key Points for 3<sup>rd</sup> Technical Cooperation:

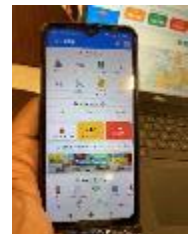
- Focus on strengthening capacity for **waste reduction** and **appropriate waste management**, thereby contributing to building **a sustainable society**.
- Improve the waste management system through **collaborative assistance between central and local governments**.
- Strengthen the waste management capacity of **the entire country** through expanding Dhaka's achievements to Chattogram and other cities



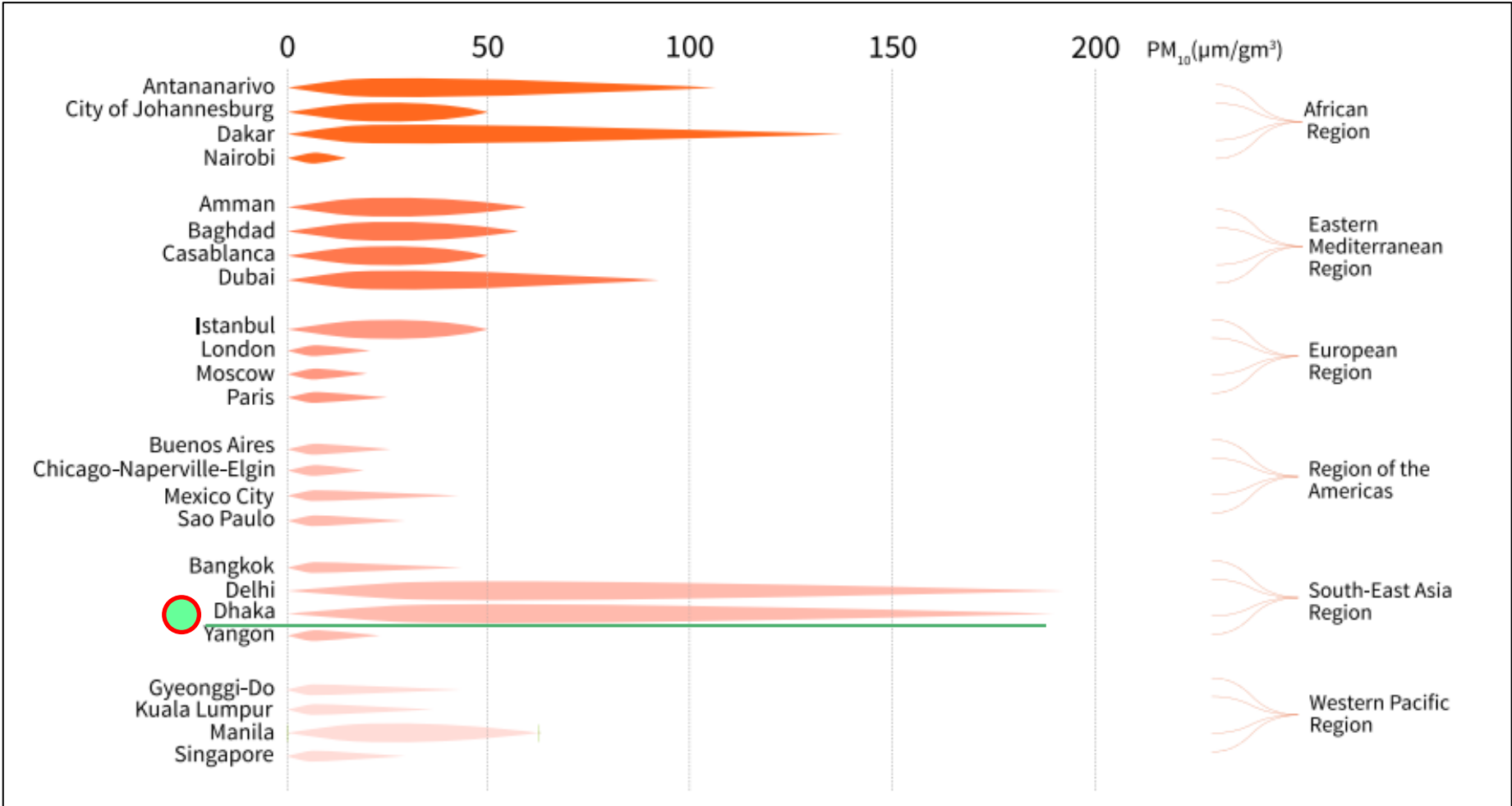
Expanding Dhaka's achievements to Chattogram and other cities

## Installation of Innovative measures (e.g. DX)

- Centralised SWM data management system.  
Support effective enforcement of Solid Waste Management Rule (2021)
- GPS-based waste collection vehicle tracking system
- Landfill Volume analysis by drone
- App with reporting function for illegal dumping (Sobar Dhaka App)



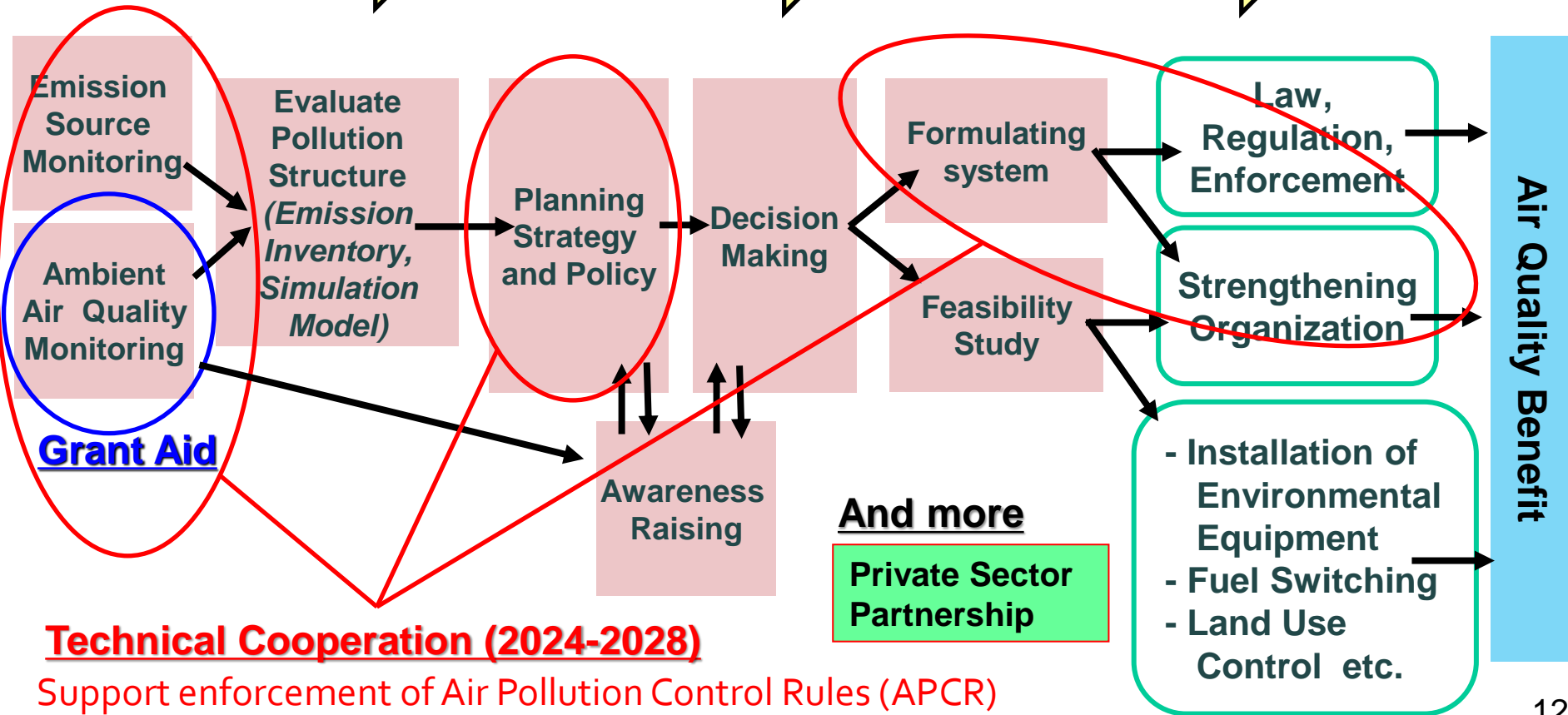
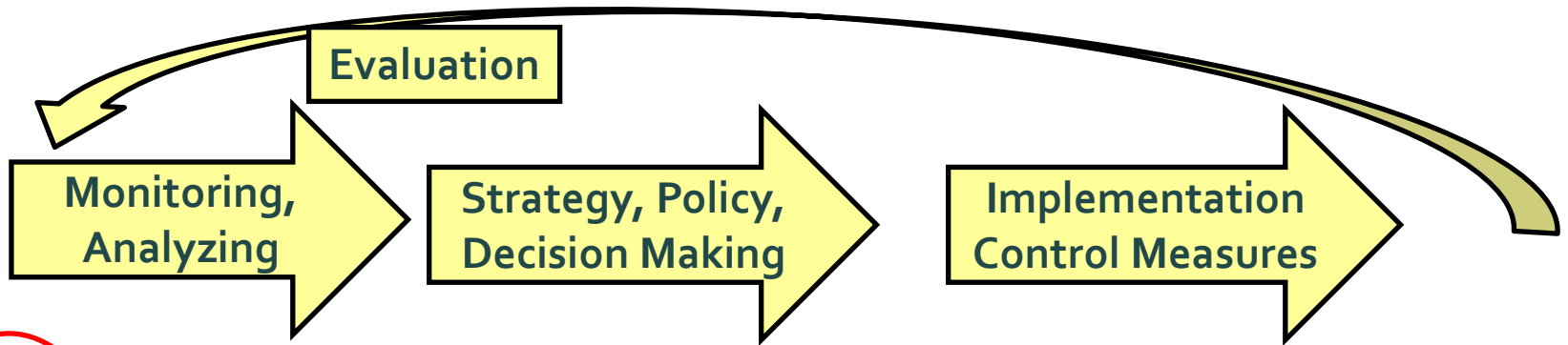
**Dhaka is one of the worst air polluted cities in the world**



WHO ambient air quality database 2022

PM10 annual means in populous cities by region, for the last available year in the period 2017-2019

# Work Flow of Air Pollution Control



**Technical Cooperation (2024-2028)**

Support enforcement of Air Pollution Control Rules (APCR)

# (1) Ambient Air Quality Monitoring

Capacity Development for Measurement of Ambient Air Quality. Air sampling and analyzing to understand the actual pollution situation.

**Continuous Air Monitoring Stations (CAMS)** on the roadside with high traffic volume will be installed by the Grant Aid Project.



Business Opportunity



## (2) Emission Source Monitoring

Capacity Development for Stack Gas Measurement.

Measurement of flue gas from a stationary source (factory, plant, boiler, etc.).



Exhaust gas PM sampler



Exhaust gas monitoring equipment



# (3) Pollution Structure Evaluation

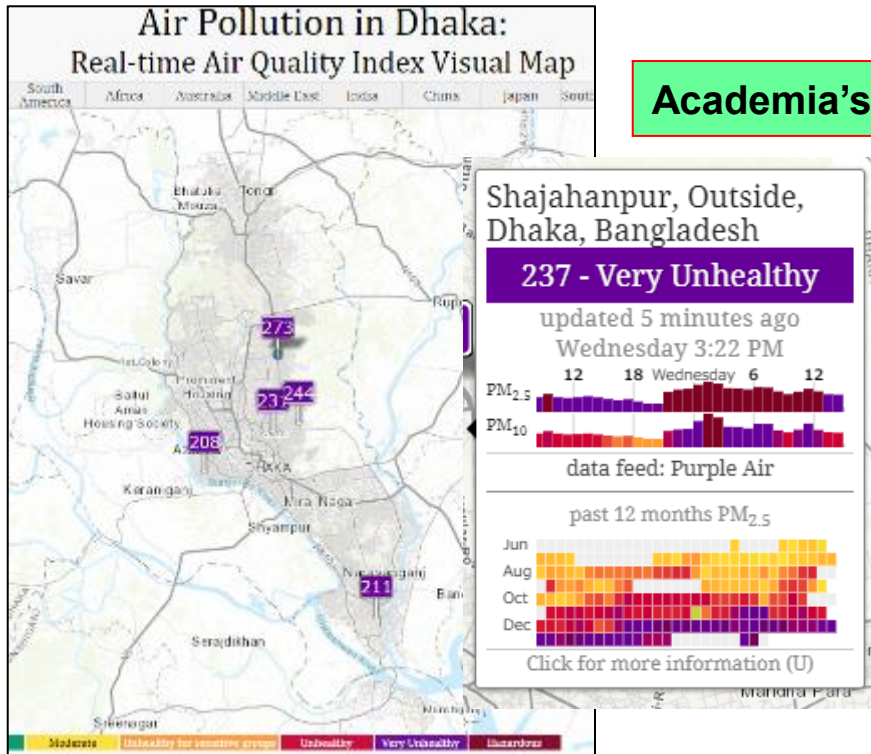
Assess and evaluate pollution structures using emission inventory, component analysis, source contribution analysis, and atmospheric dispersion simulation.

**Business Opportunity**

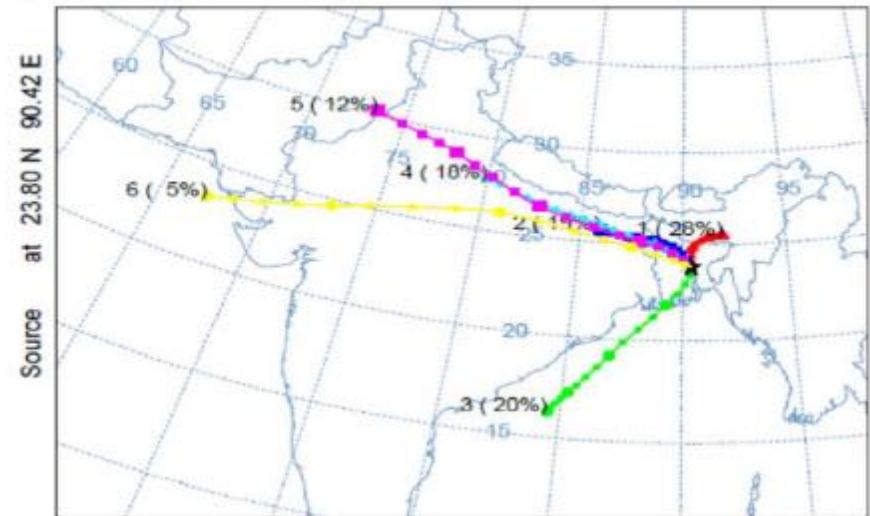


Air quality laboratory

**Academia's Involvement**



Air Quality Index in Dhaka



Trans-Boundary Pollution (PM<sub>2.5</sub>),  
Bangladesh University of Engineering and Technology

# (4) Control Measures Implementation

Identify key sectors and prepare air pollution control guidelines on each sector. Encourage the business sector to take countermeasures.



Emission from Brick kilns



Open burning in factory

## Main Sector of Emission Source

Source Sector	Sector description
Brick kilns	All brick kilns with stack, all designated as Fixed chimney kiln (FCK)
Industrial	Energy industries (Power plants), Manufacturing industries, etc. (not including brick kilns)
Traffic	Road sources (cars, taxis, motorcycles, baby taxis, busses, trucks)
Agricultural	Agricultural activities
Urban	Residential combustion
Non-road	Non-road Transport, shipping and aviation
Fossil fuel	Extraction and distribution of fossil fuels (refineries)

**Business Opportunity**



Steel Mills with gas purification systems

Support effective enforcement of Air Pollution Control Rules (APCR)



# Way forward for environmental management cooperation in Bangladesh

- Achieving “Clean City” in Dhaka and Chattogram by simultaneously promoting Waste Management and Air Pollution Control.
- Capacity Development is essential for sustainable environmental management.
- Maximizing development impact through partnership including donors, private sector, NGOs, academic institutes, local government, etc.
- Develop a good model of “Clean City” and share the experience with other countries/ regions (Asia, Africa, etc.).

