PILOTING INNOVATION FOR PASIG RIVER CLEANUP

Insights from the 6-month Clearbot Pilot Study in the Philippines, supported by
ADB Technical Assistance 10406: Accelerating Climate Action, Innovation, and Private Sector Development through Sector Operations

Welcoming Remarks

by ADB Philippines Country Director
Mr. Andrew Jeffries

Opening Remarks

By Undersecretary for Operations, John Karl Vicenta of the Office of the Presidential Adviser on Pasig River Rehabilitation

Group Photo

Presentation: Clearbot Pilot

By Ms. Samyuktha Sriram, Head of Business Development and Marketing, Clear Robotics

A GLOBAL BLUEPRINT

25+ projects globally

The Global Operating Model

ROBOTICS-AS-A-SERVICE (RaaS): A GLOBAL BLUEPRINT

International Track Record:

- ✓ **India (Rajasthan & Mumbai) :** Heritage site restoration and industrial port automation.

- ✓ **Singapore :** Precision maintenance in the world's highest-traffic urban maritime networks.

Strategic Value:

- ✓ **Cost Optimization:** 30% estimated reduction in municipal sanitation budgets.

- ✓ **Labor Evolution:** Upskilling manual labor into Specialized Autonomous System Operators.
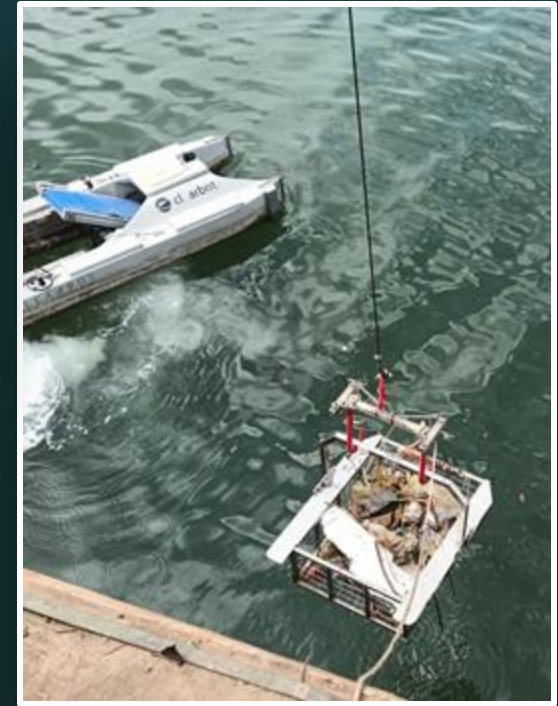
GLOBAL TRACK RECORD

PROVEN INTERNATIONALLY

Establishing the autonomous standard with governments globally:

- ✓ **India:** Heritage site restoration in Rajasthan and industrial port services in Mumbai.

- ✓ **Singapore:** Automating maintenance in the world's busiest urban maritime networks.

Result: ~30% cost reduction over traditional fleets.

EMPOWERING THE LOCAL LGU

WORKER SAFETY

Transitioning labor from high-risk manual contact with toxic debris to skilled **Autonomous System Operators**.

SMART BUDGETING

Replacing guesswork with **Data Maps**. surgical precision in planning municipal resources and city maintenance.
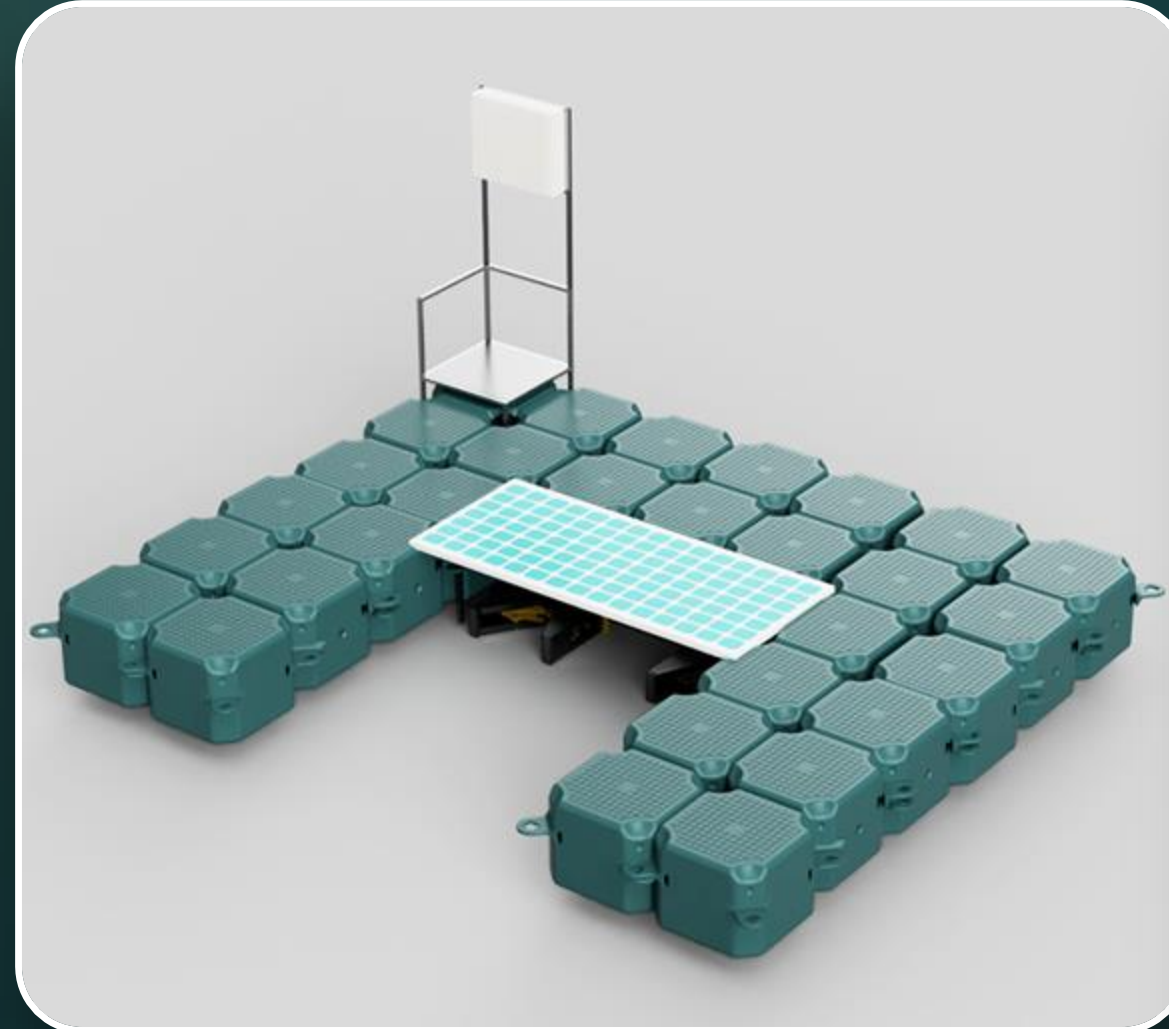
FLOOD RESILIENCE

Systematic biomass removal restores natural waterway flow, protecting riverside communities during monsoon seasons.
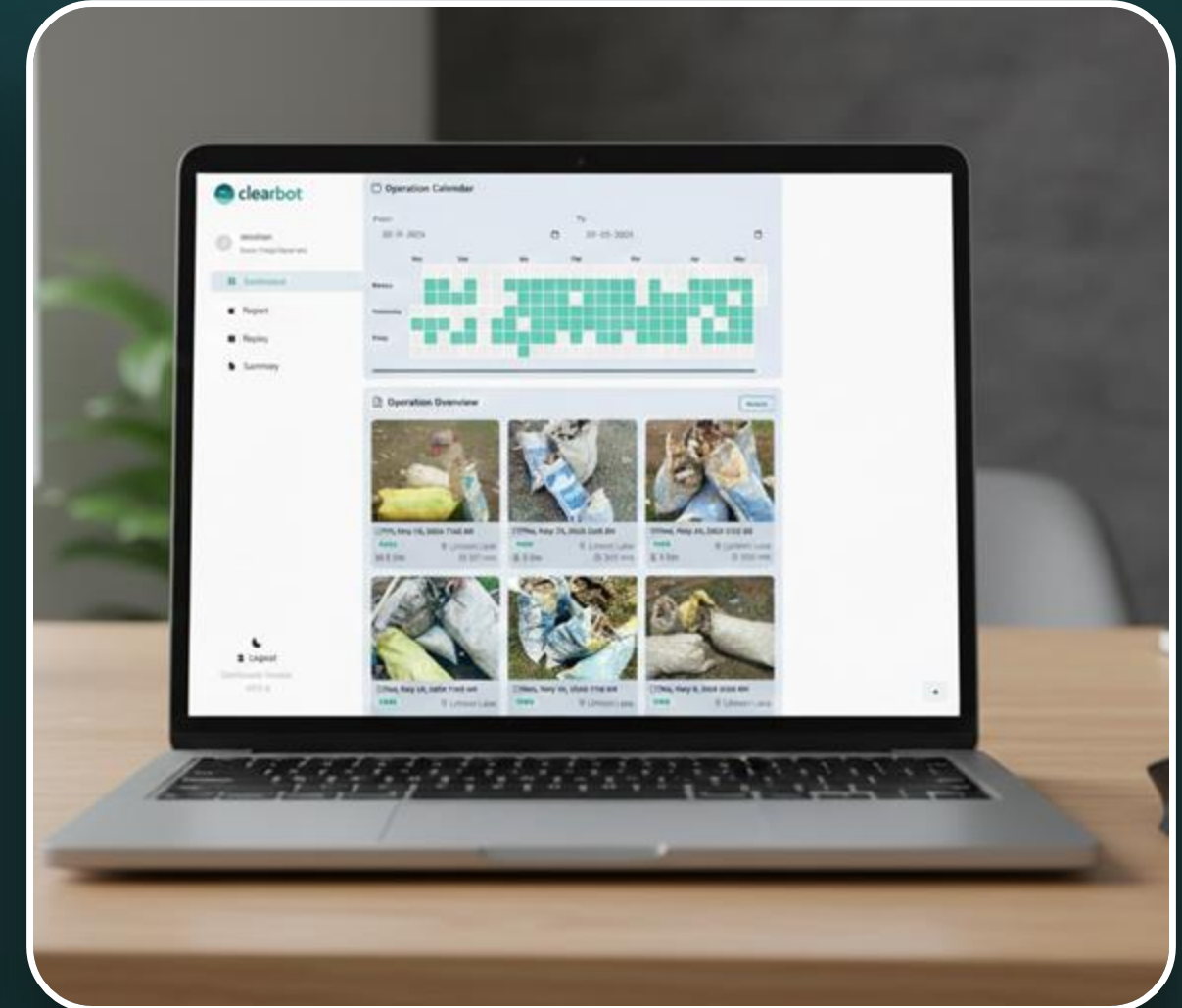
MORE THAN JUST BOATS: A SYSTEMIC ASSET

The Fleet Ecosystem:
Modular units acting as a cross-departmental network for pollution recovery, mapping, and monitoring.

Autonomous Energy:
100% solar-ready infrastructure that can

The Data Ledger
Real-time river health and debris data—turning cleanup into a measurable, reportable ESG asset for ADB.

LGU INTEGRATED LOGISTICS

CRANE-ASSISTED RETRIEVAL

Key Advantages:

Zero Infrastructure Spend:

Standard 4-point lift hooks eliminate the need for specialized docks or boat ramps.

Operational Efficiency:

Rapid retrieval for maintenance and deep-cleaning, ensuring the fleet remains active 24/7.

Risk Mitigation:

Zero water contact for workers; removal of human risk in high-current or toxic zones.

BEYOND EXTRACTION: A CIRCULAR PIPELINE

Transforming a municipal cost center (trash removal) into a resource recovery center.

- ✓ **Bio-Fuel Partnership:** Collected biomass (Water Hyacinth) and plastic waste are channeled into sustainable bio-fuel production

- ✓ **Revenue Streams:** Exploring localized biofuel creation as a municipal energy asset.

Aligns with Green Finance and Circular Economy goals by closing the waste-to-fuel loop.

Pasig City PILOT

Restoring flow in Ilugin River.

RESTORATION IMPACT TALLY (Ilugin River)

6,370
Square Meters Cleared

100
Metric Tons Removed

Equivalent to **185** pickup truckloads of waste extracted without human water contact.

SITE SUCCESS: ILUGIN RIVER

BEFORE: CLOGGED

100% surface obstruction. Blocked flow stopping city pump stations and causing flooding.

AFTER: RESTORED

Systematic autonomous removal. Restored channel flow to baseline municipal requirements.

RESTORATION IMPACT TALLY (San Juan River)

2.8

Metric Tons Removed

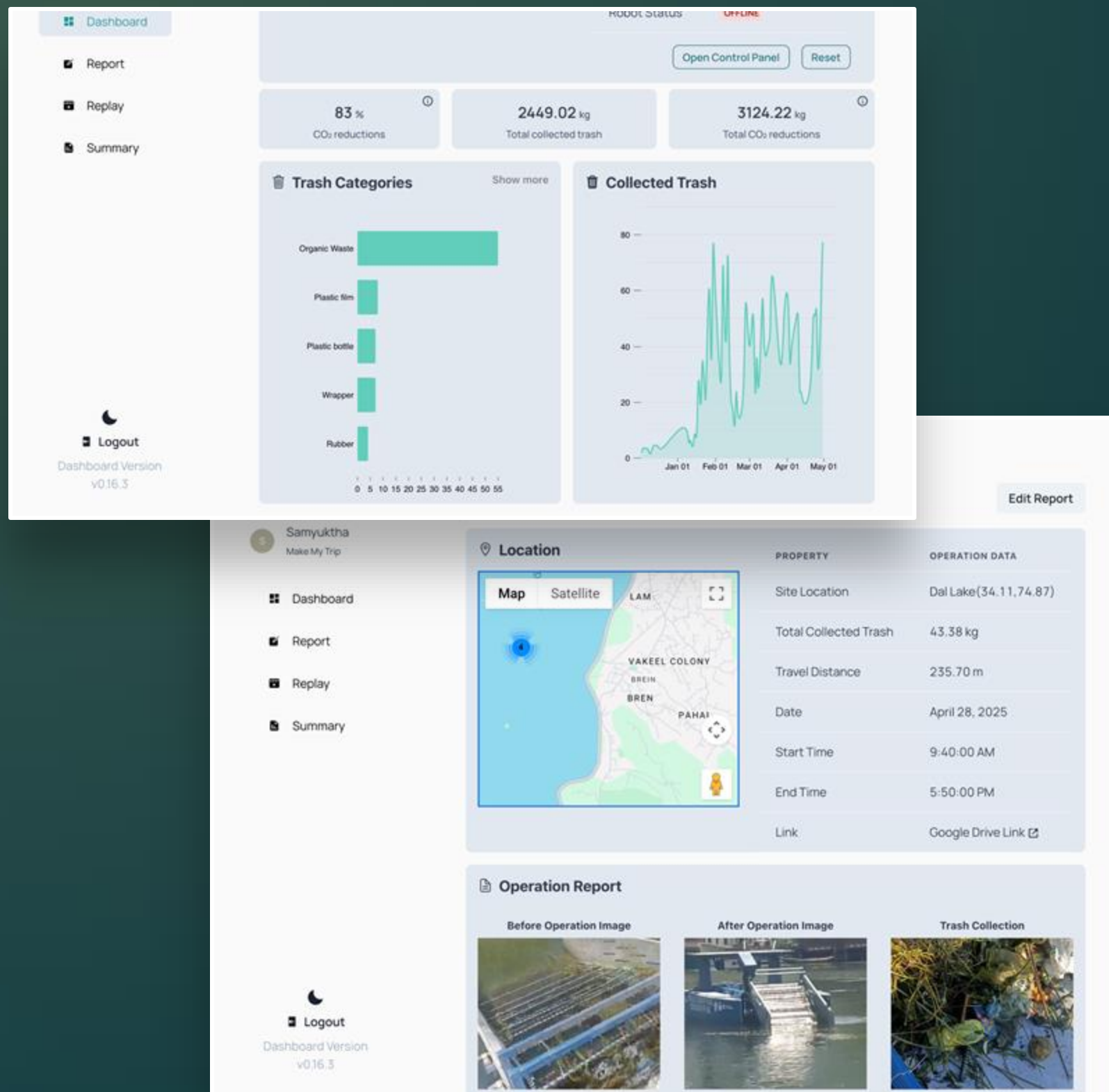# SITE SUCCESS: SAN JUAN RIVER

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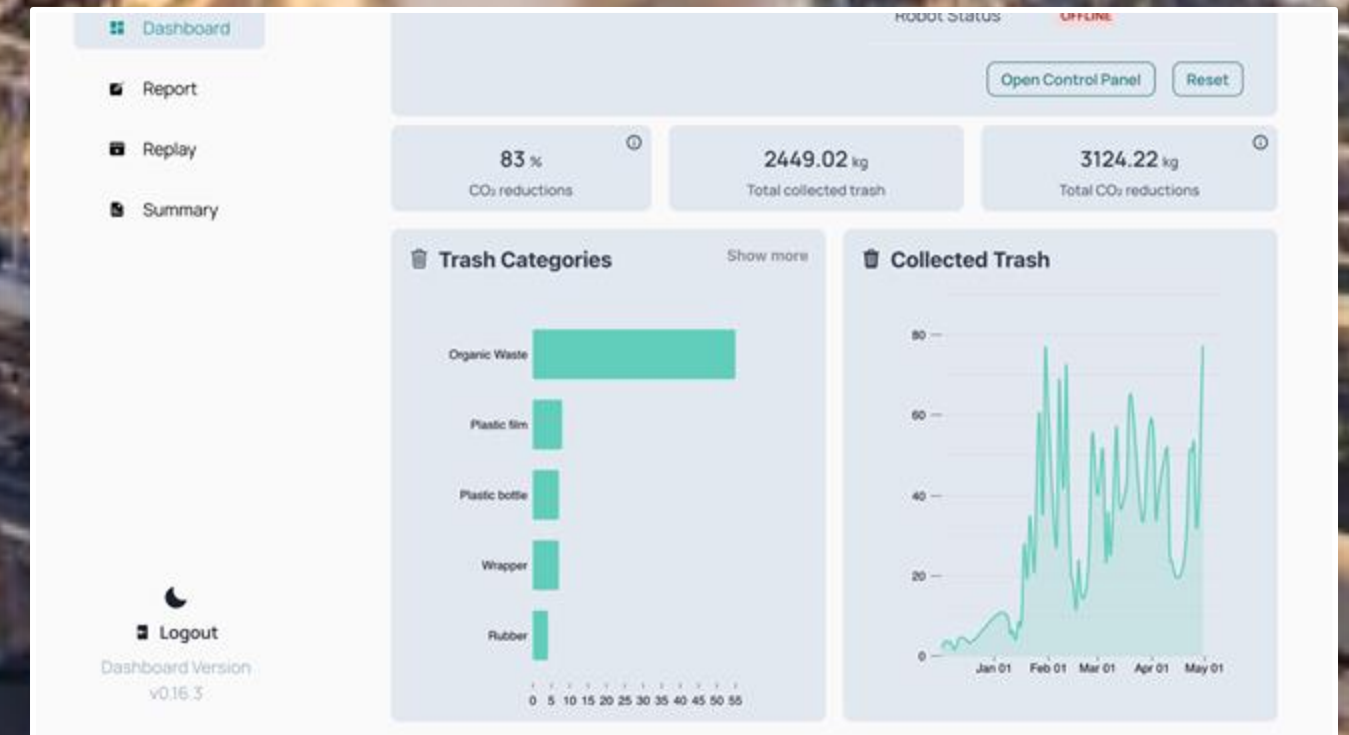
DATA-DRIVEN GOVERNANCE

PRECISION CITY SERVICES

Every recovery mission logs pollution hotspots. LGUs now

have objective data to:

- Justify and optimize sanitation budgets.
- Monitor river health KPIs in real-time.

THE RIVER'S DIGITAL BRAIN.

The Virtual Mirror: Data is fed into a "Digital Twin"—a live 3D model of the river.

- City planners can simulate storm events in the virtual model to see where trash will collect or where floods might start before they happen.

- Provides a transparent, data-backed report for ADB and city management to measure actual progress against environmental goals.

SYSTEM VALIDATION SUMMARY

Metric Type	Phase 1 Estimates	LGU Benefit
Biomass Extraction	~100 Metric Tons	Flood Prevention & Flow Recovery
Surface Cleared	~3,400 Square Meters	Community Waterway Restoration
Energy Basis	100% Electric	Zero Emissions City Operations
Logistics	Crane Retrieval	Zero New Infrastructure Cost

2026: SCALING THE NETWORK

10th October 2025

Pasig City Mayor Vico
Sotto
Launched Clearbot
Hyacinth Removal Machine

19th October 2025

President of Philippines
Ferdinand Marcos Jr.
launched Clearbot Class 3

25th November 2025

Showcased Clearbot Class
3
to the Mayor of Makati city
Nancy Binay

11th December 2025

San Juan City Mayor
Francis Zamora Launched
Clearbot Class 3

BEYOND THE BOATS: A MODULAR SYSTEM for Cities!

SAFE TECHNICAL JOBS

We move manual workers from toxic water to rooms. They become skilled operators, not just laborers.

SOLAR POWERED

The system runs on the sun. No fuel logistical headaches, no emissions, and no extra cost to the city budget.

CITY INTELLIGENCE

The robots map the river as they work. Mayors can now see where the trash is coming from in real-time to plan for the future.

WORKING WITH THE TOOLS YOU ALREADY OWN

- The biggest hurdle for new tech in managing waterways is the cost of new infrastructure. We solved this by making the tech **"plug-and-play"** with standard city assets
- This technology is **simple to deploy, easy to scale, and circular by design**. It is the bridge to a sustainable municipal infrastructure for any city in the world.

CLEANER ESTEROS. SMARTER CITIES

A CLEANER TOMORROW

Autonomous Solutions for Manila's Communities.
CONTACT@CLEARBOT.ORG | WWW.CLEARBOT.ORG

Fireside Chat

Moderator: Ms. Christine Po King Chan, Principal Urban Development Specialist (Finance and Investment), Asian Development Bank

FIRESIDE CHAT:

City-Level Perspectives on River Clean-Up Innovations

Open Forum

Key Takeaways & Closing Remarks

By Dr. Al Oga Orolfo, Director, Foreign-assisted and Special Projects Service, Department of Environment and Natural Resources (DENR)

Feedback

Please scan and complete this short 2-minute survey:

Final Photo

Urban Space Exhibit