



Japan Shibaura Wastewater Treatment Facility – Financing Resilience through Land Value Capture

CASE SNAPSHOT

| SECTOR | COUNTRY | TIMELINE | COST | RESULT |
|-------------------------------------|---------|-----------|--|---|
| Urban Flood & Wastewater Management | Japan | 2004-2013 | ¥34.1 billion (US\$310 million) — for Phase 1 improvements | <ul style="list-style-type: none">● Expansion of 135,000 m³ underground stormwater storage capacity, protecting a high-density urban bay area from flooding● A Public Private Partnership (PPP) using land value capture financed above ground commercial facilities, creating sustainable revenues to support operations and maintenance |



CASE STUDY SUMMARY: SHIBAURA WASTEWATER TREATMENT FACILITY – FINANCING RESILIENCE THROUGH LAND VALUE CAPTURE

THE OBJECTIVE

To expand stormwater detention and wastewater treatment capacity at a critical urban facility, while ensuring long-term financial sustainability by leveraging Tokyo's scarce land value. The goal was to ensure flood protection and water quality safeguards, while using above ground land rights to generate revenue streams to help cover the costs of operations, maintenance, and resilience upgrades.

THE CHALLENGE

The Shibaura district in Tokyo was facing the intersection of three major challenges.

The first was flood risk: the district was directly exposed to extreme rainfall, urban runoff, tidal surges, and typhoon-induced backflows from Tokyo Bay. Recurrent inundation stressed the combined sewer system, leading to surface flooding and the discharge of untreated wastewater into the bay.

The second was urban density and land scarcity. Constructing major new stormwater detention facilities in central Tokyo faced prohibitive land acquisition costs. Finding surface space for large civil works was close to impossible.

The third risk was financial sustainability. Infrastructure of this scale required large upfront capital and reliable O&M funding. Tokyo Metropolitan Government could not reasonably bear the entire burden alone.



Drivers for change:

- Recurring heavy rains were overloading sewerage capacity, increasing flood risks.
- Tokyo Bay's water quality was deteriorating with every overflow discharge
- The area's premium land values created both a constraint and an opportunity.
- A policy shift toward PPPs provided an avenue for mobilizing private capital to support public infrastructure.



Outcome needed:

- Flood and Wastewater Protection: Expanded storage and treatment capacity to manage 135,000 m³ of stormwater during extreme events.
- Financial Sustainability: A revenue model that tapped into high land values to finance major civil works and guarantee O&M funds.
- Urban Redevelopment Benefits: Use of otherwise inaccessible municipal land to generate wider social and commercial value.
- Community Amenity: Public-facing facilities (sports and leisure amenities) above underground tanks, turning infrastructure into a civic asset.



THE SOLUTION

The Shibaura upgrade combined a major underground engineering project with a creative PPP arrangement that financed resilient infrastructure through land value capture.

At its core, the project built a vast 135,000 m³ underground storage tank beneath the wastewater treatment site. This provides critical stormwater detention, reducing surface flooding and preventing sewage overflow during downpours. But rather than leaving the surface above this massive tank unused, Setagaya Ward (through the Tokyo Metropolitan Government Sewerage Bureau) worked with private partners to develop the surface land into a revenue-generating complex.

Through the PPP, the city leased above ground development rights to private investors. This allowed construction of commercial and recreational facilities above the tank — including a popular sports center. The revenues generated from leasing and operations were then directed back to help offset the capital outlays and ongoing operations of the sewerage system. In effect, the unused air-rights above critical flood infrastructure were converted into a financing instrument.

This arrangement demonstrated a pragmatic and replicable form of land value capture: the city could fund essential public infrastructure by

monetizing scarce land resources, while private developers gained access to a valuable site in central Tokyo. The PPP was structured so that the risks of construction and operations were shared, and the long-term O&M responsibilities were underpinned by the revenue streams secured from the surface development.

This integration of underground infrastructure with above ground PPP development brought two forms of resilience together: physical flood resilience through engineering, and financial resilience through innovative revenue generation.



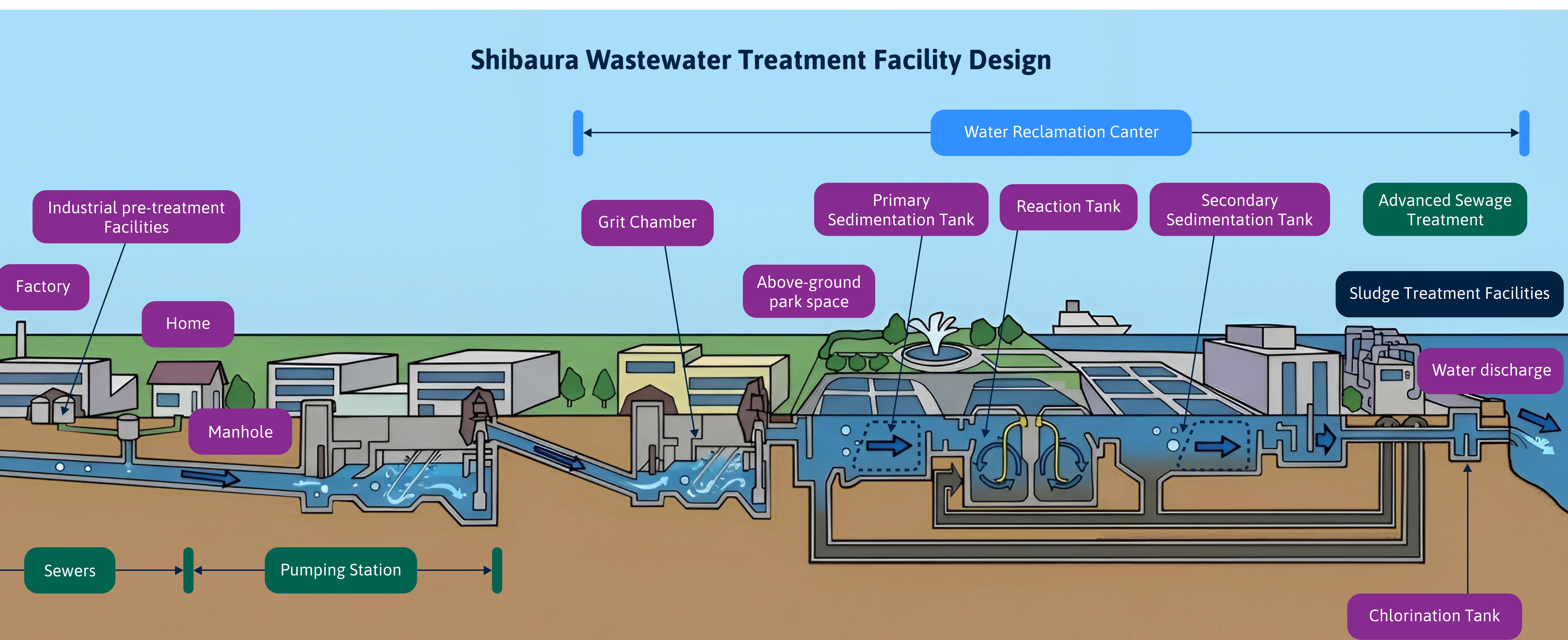
Approach To Resilience

Technical Measures

Engineering resilience was anchored in the vast underground detention system. By creating 135,000 m³ of storage, the project reduced peak runoff, protected neighborhoods from surface flooding, and sharply curtailed polluted discharges into Tokyo Bay. Construction was designed in phases to ensure the treatment facility remained operational throughout.

Multifunctional urban landscape

While the project is primarily an engineered solution, it also delivers environmental co benefits. The system reduced pollution loads in sensitive coastal ecosystems, indirectly supporting marine biodiversity in Tokyo Bay. The surface redevelopment prioritized community use — sports and recreation — and green space, turning a pure utility into a multifunctional urban landscape.



Environmental Sustainability

The project contributed to Tokyo's broader environmental sustainability agenda. By temporarily storing excess stormwater during heavy rainfall and reducing untreated wastewater discharge, it improved water quality in Tokyo Bay. The above ground sports and leisure facilities created green and open areas for public use in a dense district. In environmental as well as social terms, the facility demonstrates how infrastructure can double as an amenity and ecological safeguard, not just hidden pipes below the ground.



THE ENABLERS

Several factors made Shibaura's PPP possible.

- Policy and regulatory framework: Japan's openness to PPPs in infrastructure, supported by national legislation, gave public agencies confidence to lease land and co-develop facilities.
- Planning vision: The Tokyo Metropolitan Government recognized land as scarce capital and designed the project to unlock its value, ensuring financial sustainability.
- PPP structure: A carefully designed agreement allowed private investors to fund above ground facilities, with revenues structured to support O&M of flood infrastructure. This was critical to long-term fiscal resilience.
- Institutional capacity: Tokyo Sewerage Bureau brought advanced technical expertise, while private partners contributed commercial know-how. This blending of capacities optimized both engineering and revenue generation.
- Community acceptance: By offering visible community benefits — a sports center above the tank — the project maintained broad support for large-scale underground works.



THE RESULT

Shibaura now has reliable underground storage that significantly reduces the risk of surface flooding and water pollution. Its construction proved that complex underground detention could be achieved without disrupting existing wastewater treatment operations.

The PPP transformed flood protection into an economic development opportunity. Surface land above the underground tank now generates rental income, helping finance sewerage O&M and securing long-term maintenance budgets that are often the weakest link in infrastructure resilience. The community enjoys modern sports and recreational facilities, while local businesses benefit from reduced flood risk and enhanced amenities. Beyond engineering, Shibaura demonstrated how financing resilience through land value capture builds fiscal and institutional capacity to sustain resilience into the future.

QII PRINCIPLES IN ACTION

Principle 4 – Resilience

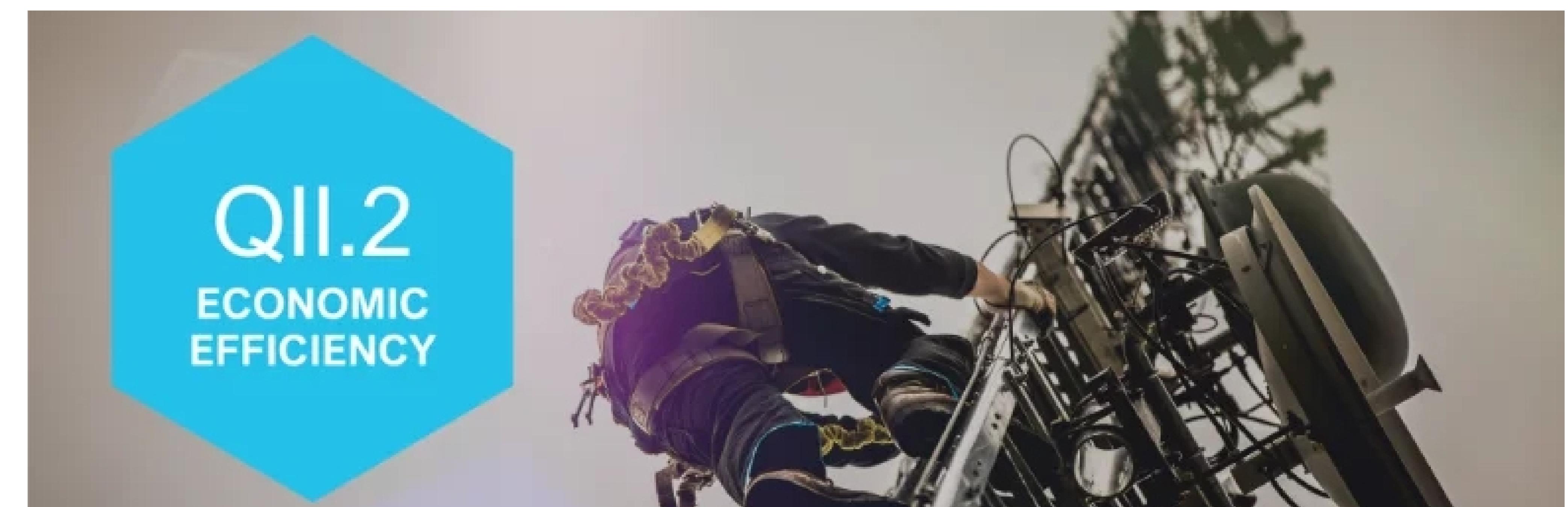
Enhanced stormwater storage and wastewater treatment capacity mitigates flood risks and ensures continuity of essential urban services in extreme weather.

Principle 3– Environmental Sustainability

Pollution control and water quality improvements in Tokyo Bay, combined with green space integration, support environmental health and urban livability.

Principle 2 – Efficiency:

The Shibaura facility demonstrates efficiency not only in its multi use design, which layers community amenities on top of essential flood infrastructure, but more importantly in the way it maximized financial resources across the asset lifecycle. By structuring a Public Private Partnership around land value capture, Tokyo Metropolitan Government leveraged the extraordinary land values of central Tokyo to finance infrastructure that would otherwise have been prohibitively expensive. Private developers assumed substantial roles in construction, surface development, and long term O&M contributions. This reduced the fiscal burden on government, ensured a sustainable revenue stream, and promoted economic efficiency from design, through financing, to maintenance — making resilience financially viable for the long term.



RELATED REFERENCES

Want to explore this case further? Access the detailed case study [here](#).

Related Materials

- QII Partnership, Guidelines and Knowledge Products on Climate-Resilient Infrastructure?