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ReCharge

***Restoring Aquifers and Empowering Communities through
Smart Water Injection for Jakarta's Coastal Resilience***

THE EXECUTIVE
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The Big Four

Jakarta Is Sinking. Safe Water Isn't Keeping Up.

Sinking megacity.

“~40% of Jakarta is below sea level.” Coastal neighborhoods face chronic flood risk as land keeps settling.

Subsidence isn't slowing.

Recent geodetic studies in North Jakarta report ~3–10 cm/year of land subsidence

Water gap, every day.

A 2022 study found that northern coastal districts are priority areas for piped expansion because only small regions are covered.,

Over-extraction crisis.

Jakarta relies on groundwater for ~66%; North Jakarta has sunk more than 4 meters since the 1970s. The city plans to have full piped water by 2030 and groundwater-free zones.

What happens if we wait.

Deeper flooding, costlier pumps/repairs, seawater intrusion, and ever-harder expansion of safe water service.

Sources: Space4Water (2023, 40%
sea); Rukayah et al. (2025, 3–10 cm/yr; cf. Harintaka 2024); Eco-Business (2024, 67% piped); PAM Jaya→100% by 2030 (Jakarta Post 2024; ANTARA 2024).



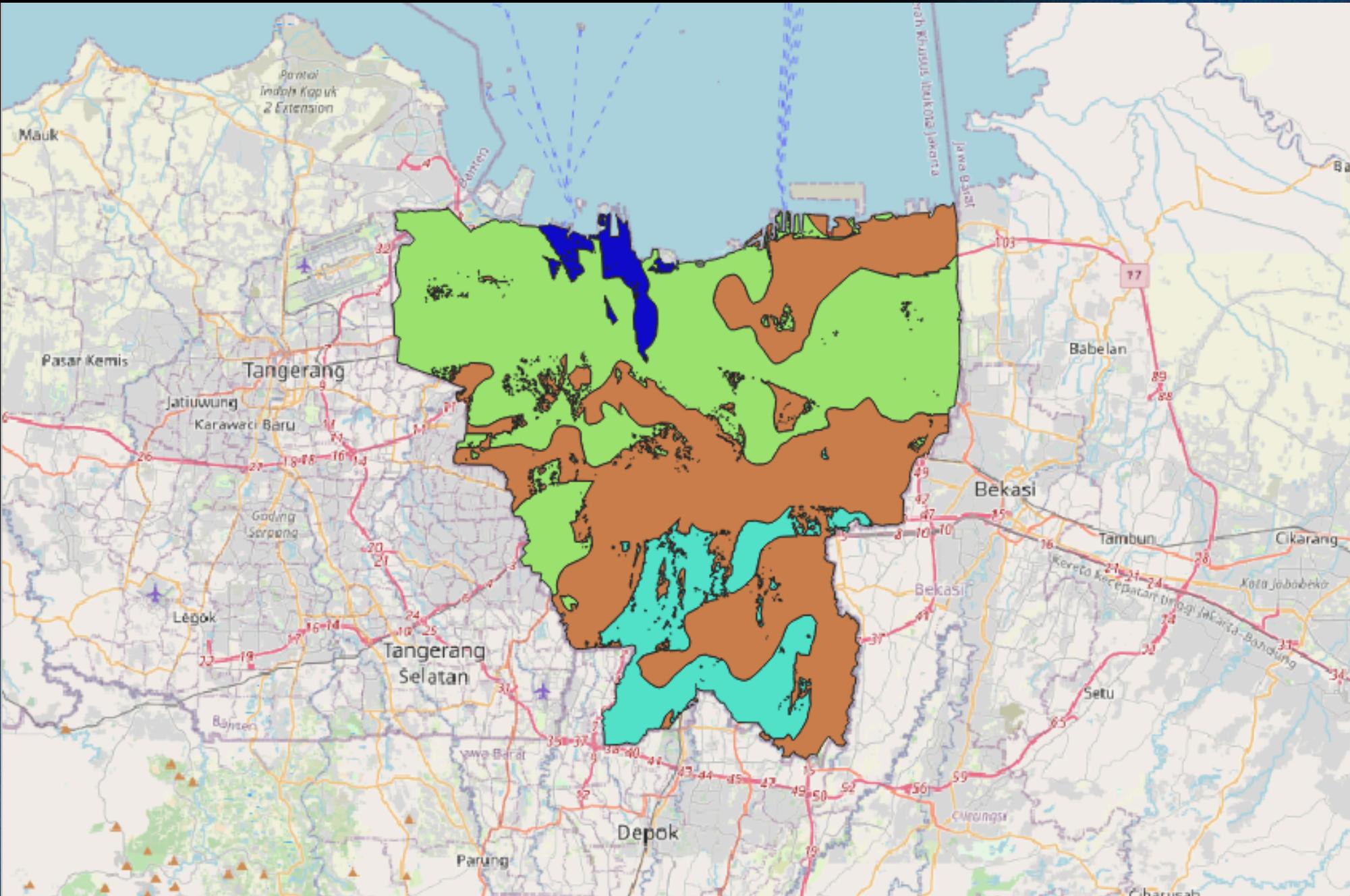
ReCharge: From Maps to Moves

A city web platform that turns messy geospatial + sensor data into sites for injection wells and reliable clean-water access.



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Injection Suitability Index



- 1 Not Potential
- 2 Less Potential
- 3 Potential
- 4 Very Potential



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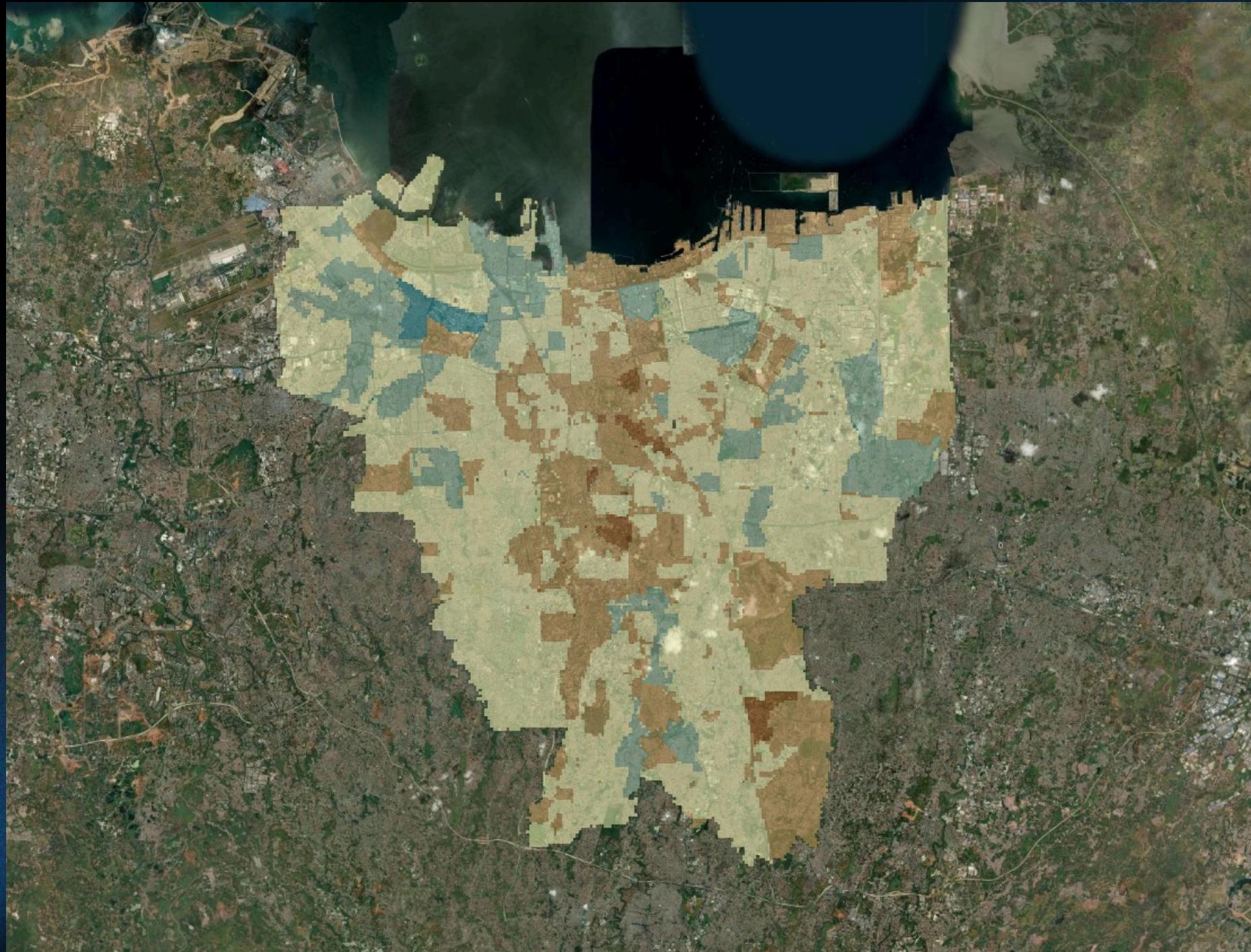


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Clean Water Demand Index



- Very Low Demand
- Low Demand
- Moderate Demand
- High Demand
- Very High Demand



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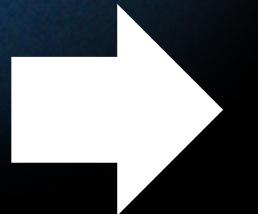


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ReCharge: Salt Out, City Up

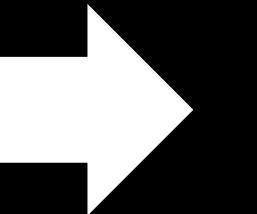
1. Pre-treatment:

- 3-layer multimedia filter
 - (gravel, sand, anthracite)
 - TDS ↓ from 35,000 ppm → 21,000–24,500 ppm
- Microfiltration:
 - Membrane pores (0.1–10 microns)
 - Removes microorganisms & fine particles
 - TDS ↓ to 14,000–17,500 ppm



2. Reverse Osmosis (RO):

- Salinity ↓ by 98–99%
- Produces clean water + brine
- CCRO: Closed-Circuit RO minimizes brine & recovers energy with Energy Recovery Device



3. Post-Treatment:

- Tested the water quality with salinity and pH sensors
- If not meet the standard, water will go through the RO process one more time

ReCharge: Power System Design

Main energy sources: Solar PV panels (PLTS) and an Energy Recovery Device (ERD)

Total daily demand: 48 kWh/day → reduced by 30% with ERD = 33.6 kWh/day

Required solar panels: 19 units (300 W per panel)

Item(s)	Qty	Price
Solar Panel (300 W)	19 Units	Rp 47,500,000 (Rp 2,500,000 each)
6 kW Inverter	1 Unit	Rp 15,000,000
10 kWh Battery	5 units	Rp 60,000,000 (Rp 12,000,000 each)

Total Cost: Rp 122,500,000

Monthly consumption: 33.6 kWh × 30 days = 1,008 kWh

Estimated monthly bill: 1,008 × Rp 1,444.70 = Rp 1,454,329.60

Payback period: ≈ 7 years

Advantages: Energy-saving · Eco-friendly · Cost-efficient



ReCharge: Interface



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ReCharge
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