

Safe drinking water, measured and accounted for.

SLDS is Spoorthy Innovations' [Smart Liquid Dispensing System](#) — the platform behind Andhra Pradesh's NTR Sujala cluster service. Treatment, GPS-tracked transport, unmanned kiosks and a central dashboard, in public service since 2017.

9 years

24×7 public service

413

Dispensing units live

27

RO mother plants

1.61M

Audited transactions

Spoorthy Innovations Private Limited · Hyderabad | Briefing for State Governments & Rural Water Supply Departments



Live Dashboard figures as of 8 September 2026:

27 mother plants, 413 kiosks, 71,891 registered consumers, 4 districts, **2 service providers**.

Six commitments, each backed by evidence

01 A proven solution

Nine years of continuous 24×7 operation, evidenced by live production data.

03 Centralised monitoring

TDS, pH, tank level, power, flow and unit health in one control view.

05 Accountable by design

No cash at the tap. Metered litres. Server-side records that must reconcile.

02 Public benefit

Safe, walkable, prepaid RO water. The AP tariff is Rs 2 per 20 litres; your state sets its own.

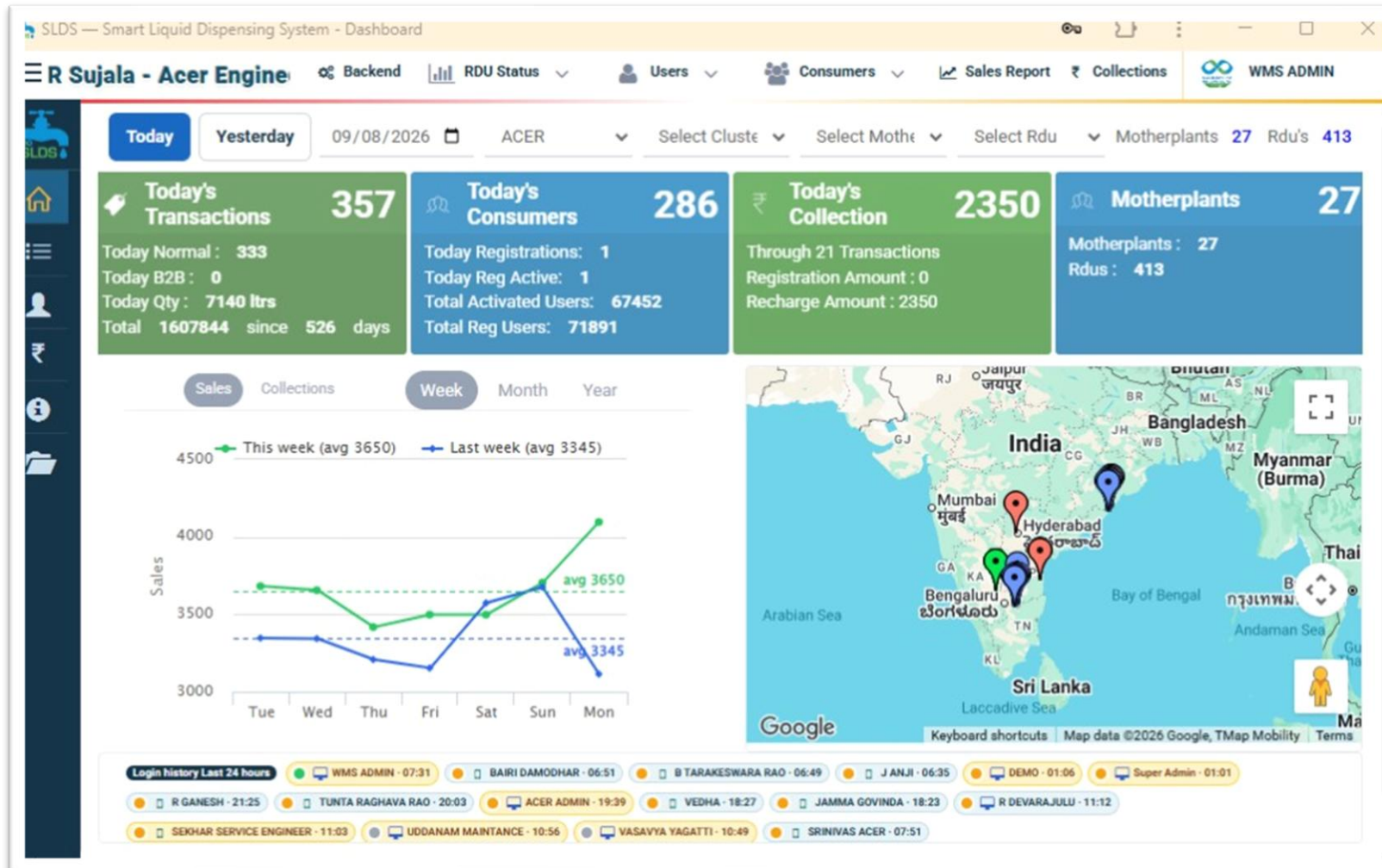
04 Remote operations

Tariffs, calibration, cards and firmware pushed to every village from the centre.

06 A working technology stack

Sixth-generation kiosk controllers, cellular telemetry, cloud platform, field apps.

This is not a proposal. It is a running public utility.



THE PROBLEM

Stand-alone village RO plants fail quietly

Andhra Pradesh installed about 800 individually operated plants under NTR Sujala from 2014. A 2015 CESS study found the same failure pattern everywhere.

Operator dependent

Water is available only when someone is present. Cash collection is manual and unverifiable.

No quality visibility

Nobody at district or state level can see today's TDS, pH, or whether the plant is running.

Power and distance

Plants sit at the source, often far from the village, on 3-phase power that may last a few hours a day.

No records

No consumer data, no usage history, no way to reconcile water produced, water sold and money collected.

What CESS said actually matters

Four performance factors: consistent water quality, accessibility, transparency and self-sustainability. The cluster hub-and-spoke model with IoT-controlled dispensing, piloted at Kuppam, was the best performer on all four. That model is what SLDS runs today.

Nine years of uninterrupted public service

9 years

Continuous operation under the Government of AP's NTR Sujala programme

24×7

Unmanned kiosks, open day and night, no operator at the tap

4 districts

On ntrsujala.in — two operators, one government portal

1 portal

Government sees every operator's data; each operator's data stays ring-fenced

One platform, multiple operators

Two independent service providers run their own districts on the same SLDS platform, each with separate data, users and pricing. Government users see district and state roll-ups of the same live data. Photos and figures in this deck are from that live deployment — not a pilot lab.

Four clusters on the live platform — 27 plants, 413 kiosks

Cluster	District	Mother plants	Dispensing units
Kuppam Constituency	Chittoor	16	193
Uddanam	Srikakulam	7	150
Nellore	Nellore	3	40
Kuppam Urban	Chittoor	1	30
Total		27	413

Source: live WMS, 8 September 2026 — 27 mother plants and 413 kiosks. Cluster names match the operating dashboard. A new state would start with a surveyed pilot cluster, not a copy of this map.

Why these places

Uddanam and the Kuppam belt are among the most fluoride- and salinity-affected regions in the state.

The programme was built for exactly these habitations. They still carry the densest deployment.

4 districts • 2 service providers • 413 units

Pilot, independent study, then public service — still running

2014

Kuppam pilot

Cluster model and IoT dispensing tried in a water-stressed constituency.

2015

CESS study

Independent review ranks the hub-and-spoke model best on quality, access, transparency and sustainability.

2016–17

Stressed mandals

Pilots in fluoride- and CKD-affected belts, including Uddanam and Prakasam.

2017–2026

Public utility

24×7 service on SLDS. Sixth-generation hardware in the field in 2026.

Approved, funded and operated under AP Rural Water Supply & Sanitation, with district dashboards and a ministerial feed. This briefing does not treat 2018 planning tables as today's footprint.

One mother plant, many village kiosks



HUB

Mother plant

10,000 L/h at the source. RO / UF / UV / ozone, sized to the water. Diesel backup through power cuts.



SPOKE FEED

Transport unit

5,000 L SS tanker. GPS, geofence, sealed dry-lock transfer.



LAST MILE

Village kiosk

5,000 L in the habitation. Tap a prepaid card, 24x7, unmanned.

What a family actually gets

Safe water, verified

Multi-stage RO, UV again at the kiosk. Live plants reporting TDS 41–95 ppm against the IS 10500 limit of 500. pH 6.8–8.2, inside 6.5–8.5.

Inside the habitation

The plant stays at the source. The kiosk comes to the people — 413 units across four districts.

Open any hour

Unmanned, card-operated. Early morning, late evening, holidays. Offline validation when the network drops.

Simple to use

Tap the card, press the button. Voice prompts in the local language, balance on the display. Two families can fill at once.

A health intervention

First deployed in fluoride- and kidney-disease affected mandals, where safe water is a medical necessity.

Fair access

Category, daily and monthly limits are set centrally. No queue-jumping and no discretion at the tap.

In Andhra Pradesh: Rs 2 per 20 litres

That is the documented NTR Sujala programme tariff — 10 paise a litre. A new state sets its own tariff, categories and subsidy on the same platform.

AP PROGRAMME TARIFF

Rs 2

per 20 litres · 10 paise a litre

A household of five drinking about 10 litres a day spends roughly Rs 30 a month on treated drinking water. Packaged water at retail rates costs many times more. Comparative retail prices are indicative, not programme data.

On the live dashboard today

286 households drew water · 7,140 litres · Rs 2,350 collected

Differential pricing

Households, institutions, bulk and chilled water — separate slabs and limits, changed from the office.

Prepaid, no receivables

Value is loaded before the tap opens. Agents recharge; the device confirms the write.

Your policy, this platform

Tariff, subsidy and categories are configuration. They are not hardcoded to Andhra Pradesh.

Five steps, and the household is on the system



Treated water, in the can, in the habitation.



Tap the prepaid card at the village kiosk.

1 Register

Agent enrolls the household and issues the card.

2 Recharge

Value is queued centrally and written to the card.

3 Dispense

Tap at any kiosk in the cluster. Metered litres.

4 Confirm

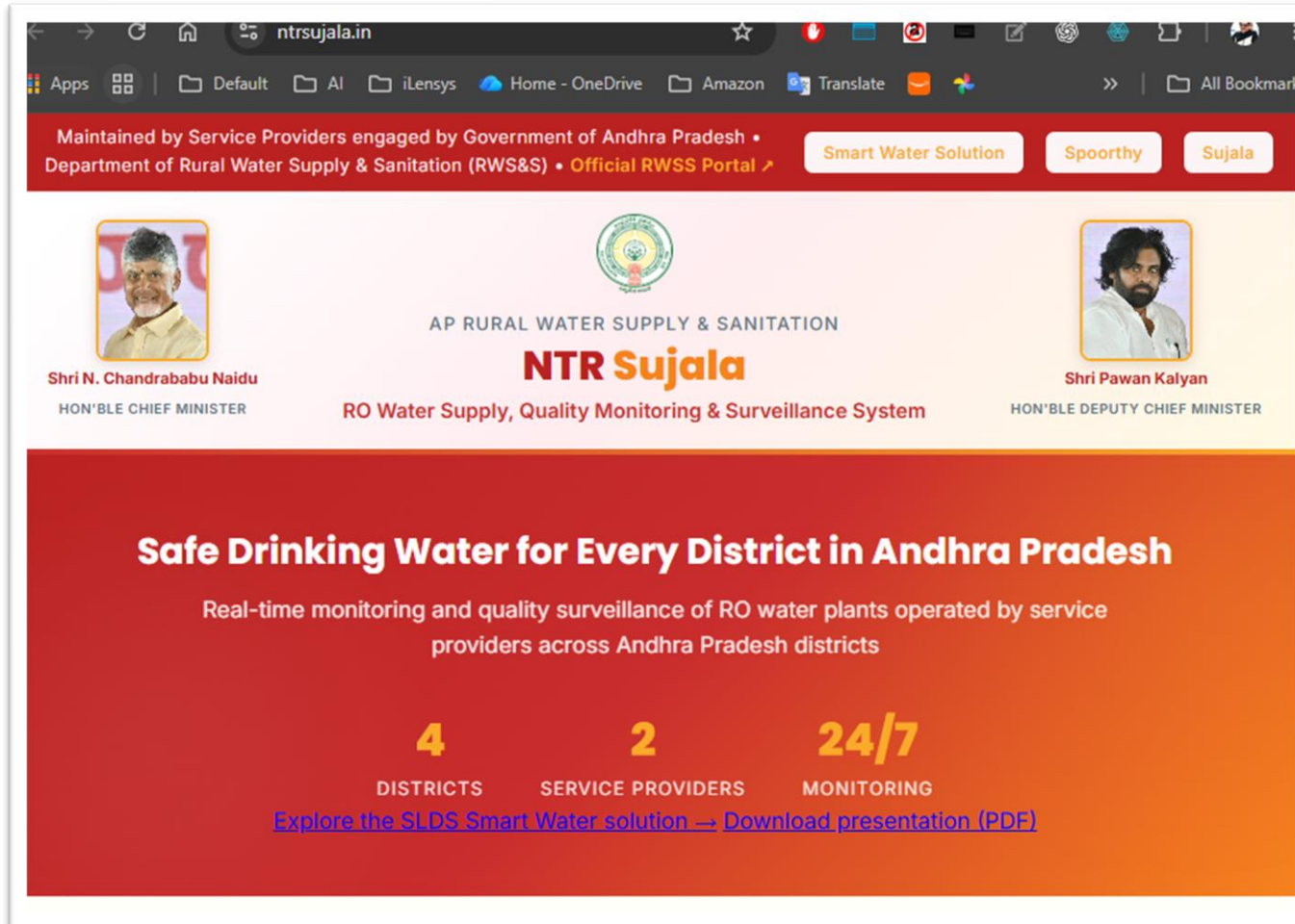
Voice + display. Stored locally at once.

5 Reconcile

Sale syncs: consumption, revenue, the record.

The same service, presented for the department

ntrsujala.in — AP Rural Water Supply & Sanitation. Live district monitoring of RO plants run by engaged service providers.

**4**

Districts on the portal

2

Service providers, one platform

24x7

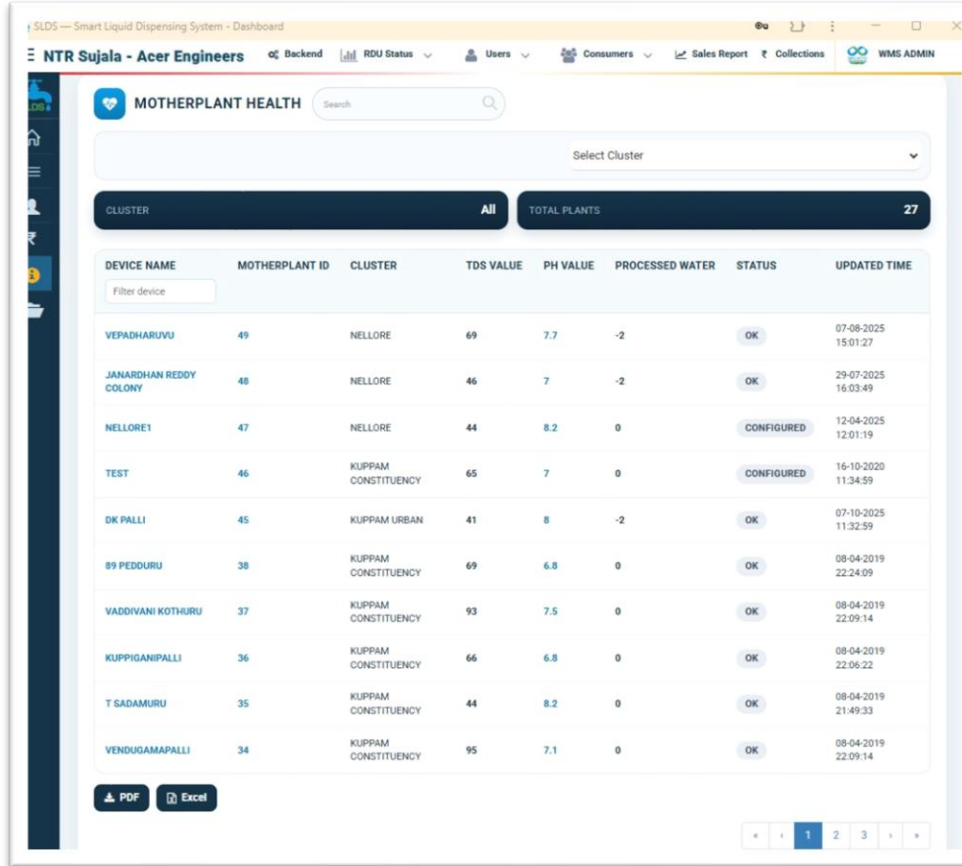
Monitoring, not office-hours reporting

ntrsujala.in

Public government entry point

Every mother plant reports TDS and pH to the centre

Live mother-plant health register. Values sit against IS 10500 — TDS limit 500 ppm, pH band 6.5 to 8.5.



The screenshot shows the 'MOTHERPLANT HEALTH' dashboard. It includes a search bar, a 'Select Cluster' dropdown, and a table with columns: DEVICE NAME, MOTHERPLANT ID, CLUSTER, TDS VALUE, PH VALUE, PROCESSED WATER, STATUS, and UPDATED TIME. The table lists 10 devices with their respective TDS and pH values. At the bottom, there are buttons for PDF and Excel exports, and a pagination control showing page 1 of 3.

DEVICE NAME	MOTHERPLANT ID	CLUSTER	TDS VALUE	PH VALUE	PROCESSED WATER	STATUS	UPDATED TIME
VEPADHARUVU	49	NELLORE	69	7.7	-2	OK	07-08-2025 15:01:27
JANARDHAN REDDY COLONY	48	NELLORE	46	7	-2	OK	29-07-2025 16:03:49
NELLORE1	47	NELLORE	44	8.2	0	CONFIGURED	12-04-2025 12:01:19
TEST	46	KUPPAM CONSTITUENCY	65	7	0	CONFIGURED	16-10-2020 11:34:59
OK PALLI	45	KUPPAM URBAN	41	8	-2	OK	07-10-2025 11:32:59
B9 PEDOURU	38	KUPPAM CONSTITUENCY	69	6.8	0	OK	08-04-2019 22:24:09
VADOIVANI KOTHURU	37	KUPPAM CONSTITUENCY	93	7.5	0	OK	08-04-2019 22:09:14
KUPPIGANIPALLI	36	KUPPAM CONSTITUENCY	66	6.8	0	OK	08-04-2019 22:06:22
T SADAMURU	35	KUPPAM CONSTITUENCY	44	8.2	0	OK	08-04-2019 21:49:33
VENDUGAMAPALLI	34	KUPPAM CONSTITUENCY	95	7.1	0	OK	08-04-2019 22:09:14

On this screen

TDS 41–95 ppm

IS 10500 limit 500

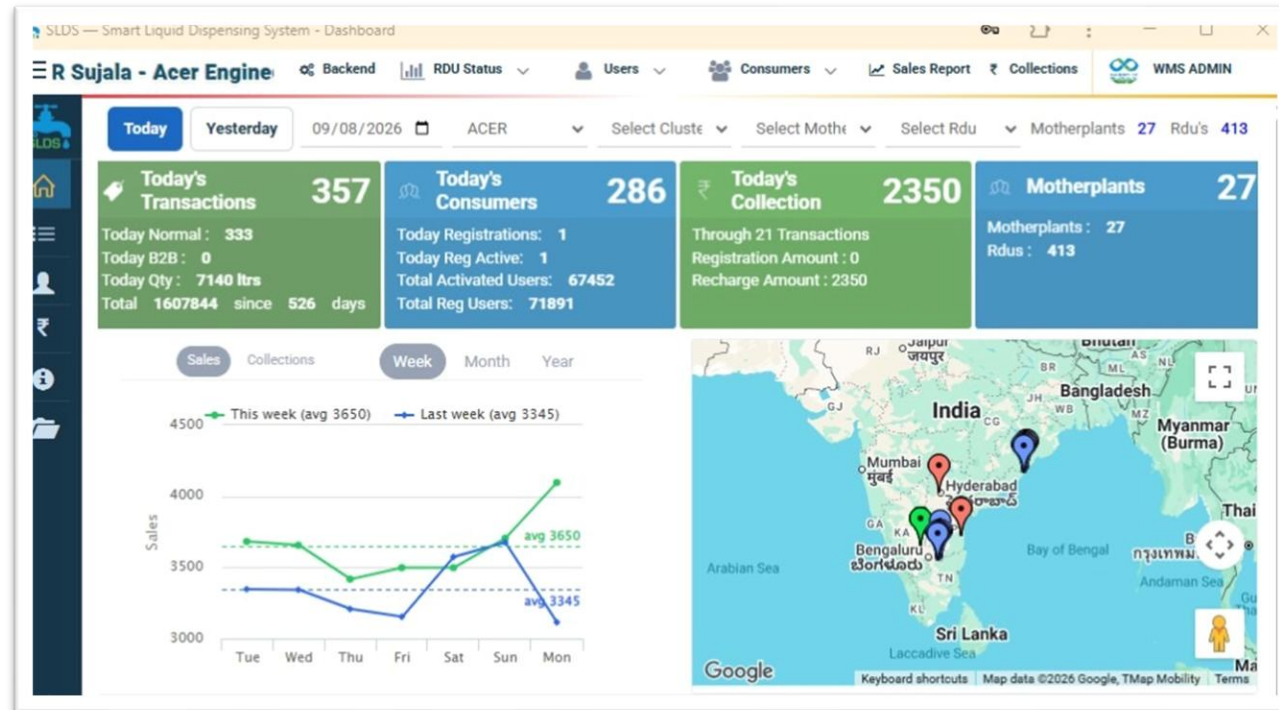
pH 6.8–8.2

Permitted 6.5–8.5

27 plants

Filter by cluster. Export PDF or Excel.
Last-update time is visible, so a silent plant cannot hide.

The centre can see the estate — and change it



Heartbeat every 5 minutes

Tank, tap, power, signal. Exceptions only — not 413 screens to watch.

Change it from the office

Tariffs, limits, calibration, firmware. CRC-checked, no truck roll.

Offline still serves

Card holds the balance. Queue drains when the network returns.

Live operator dashboard · 8 September 2026

413 kiosks, 27 plants, sales, collections and the map — without a site visit.

Android in the habitation, console at the centre

Registration

Enrol the household, capture ID and mobile, issue the card on the spot.

Recharge

Load value; the device confirms the write. Server transaction ID on every recharge.

Consumer search

Find the person, card, balance and history without a paper register.

Reports and plant info

Agents see what they need for the day; they do not see the whole estate.

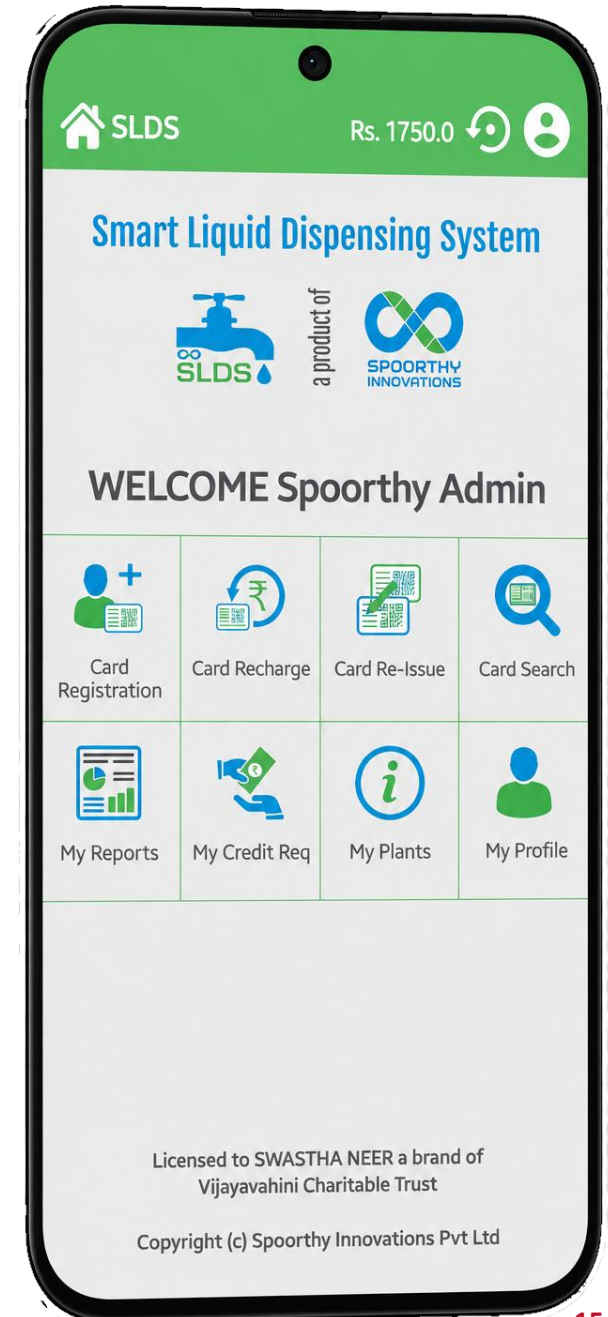
NFC • Bluetooth • mobile data

Field teams on Android

Backend tools add consumer history, device-to-kiosk mapping, per-tap calibration and role-based access.

Layered access: agent, operator, district, state — each sees only their jurisdiction.

A Payments menu is not evidence of every bank or gateway. Settlement follows the operating contract.



No cash at the tap. No unmetered litre. No unrecorded sale.



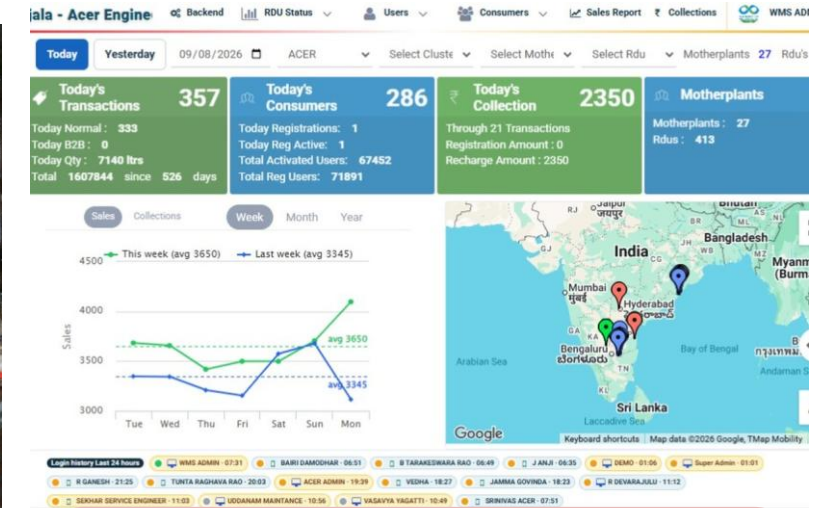
The card

Encrypted MIFARE, locked to one cluster.
Value only via a server recharge ID.
Duplicates rejected.



The kiosk

Valve opens after card, balance and limit checks. Flow sensor logs actual litres. No card, no water.



The office

Every sale uploads with time and card number. It cannot be deleted at the kiosk. Collections reconcile to the server.

Water audit: litres processed, GPS-tracked transport, tank level, metered tap, prepaid card. Three records must agree — water moved, water metered, value deducted.

Why a discrepancy is hard to hide

Card	Kiosk	Cloud	Operations
Per-card keys and integrity checks	Unmanned: no cash, no operator discretion	Server-side transaction IDs; duplicates rejected	Agent collections vs server recharges
Locked to organisation and cluster	Flow-metered dispensing; real litres logged	Role-based access; single active session	Invoices for registration and recharge
Balance and counters travel on the card	Offline queue on SD; nothing dropped locally	User audit with IP, place and device	GPS geofence; deliveries vs tank levels
Remote block; unblock only from the server	Device serial mapped to its kiosk	Separate database per operating organisation	Government sees the same live data

SLDS V6 — designed for the village, not the laboratory

Controller

32bit dual-core, 240 MHz · firmware 6.3 on hardware 6.x

Measurement

Pulse-counting flow sensors, tank level, AC presence, DC voltage, RS-485 gauges

Resilience

SD offline queue, battery-backed clock, mains-loss detection

Taps

Two independent RFID readers, LCDs, buttons and solenoids

Connectivity

GSM / GPRS (2G through LTE), Bluetooth service app for technicians

People

Voice prompts in Indian languages — usable without literacy



Lineage since 2014: from Banana Pi Linux controllers to today's ESP32 platform. Refined across 413 units — including failure modes you only discover in a village.

The stack that is in production today

Layer	What it is	What it provides
Field device	SLDS V6 controller	Card validation, valves, flow, voice, offline queue
Connectivity	Cellular GSM / GPRS	5-minute health heartbeat; store-and-forward sales
Device services	FOTA and config push	Firmware, tariffs, limits, calibration without a site visit
Application	Java / Spring Boot REST	Consumers, cards, plants, units, pricing, alerts, SMS
Data	MySQL, one DB per operator	Ring-fenced tenants on one government portal
Operations	WMS / Bibo dashboard	Clusters, health, sales, collections, user audit — also as a phone app
Oversight	Government portal + APIs	District roll-ups and a ministerial dashboard feed
Field	Android agent + Bluetooth tools	Register, recharge, reissue, on-site diagnostics

Transparency for the department, the district and the minister

Layered access

State, district, cluster, plant and agent views. Each sees only their jurisdiction, from the same live data.

KPIs, not anecdotes

Functional vs non-functional units, litres sold, active consumers, collections, incident age — by day, week, month, year.

Multi-operator by design

Several service providers can run districts on one platform under one portal, each ring-fenced.

Audit-ready trails

Water audit, cash audit and user audit. Every action attributed to a login, device and place.

Open to integration

REST APIs feed a ministerial dashboard or any state data platform. SMS and e-mail gateways plug in.

Donor and CSR friendly

Clusters, plants and kiosks can be tracked against the sponsor that funded them.

A funded cluster, with local jobs — not a one-time installation

Lean cluster team

- 1 plant manager and 2 technicians per cluster.
- 1 driver per transport unit.
- 1 local agent per kiosk on honorarium plus commission.
- About 25–30 local livelihoods per cluster of 20 kiosks.

Prepaid revenue

- Consumers pay in advance through agents — no receivables at the tap.
- Collections and litres sold reconcile daily.
- Differential tariffs for institutions, bulk and chilled water.
- Capex and opex per litre can be tracked per cluster.

Maintenance by data

- Preventive schedules for CIP, UV lamps, filters and vehicles.
- Breakdowns raised by alerts, not complaints.
- Health logs support root-cause analysis.
- Reject water blended, reused for plantation, or evaporated per its quality.

2018 AP planning figures exist and can be shared as history. They are not a quotation for 2026. Cost per delivered litre must be re-costed for your state's tariff, power, fuel, labour and source water.

Technology partner — plants, kiosks and policy stay with you

- SLDS V6 kiosk controllers, sensors and card readers
- Encrypted smart cards and the card-issuing workflow
- Cloud platform, dashboards, APIs, FOTA and alerting
- Agent Android app and technician tools
- Integration with the state's portal or ministerial dashboard
- Plant, transport and kiosk specifications for tendering
- Training for RWS&S engineers and operator teams
- Ongoing support, upgrades and a 9-year operating playbook

Flexible engagement

Technology partner to the department, to a state utility, or to empanelled service providers.

Government-owned assets with private O&M, CSR-funded clusters and PPP structures have all been run on SLDS in Andhra Pradesh.

A new administration is onboarded as its own tenant — own database, tariffs, branding and dashboards.

From one pilot cluster to a statewide service

PHASE 1

4–6 weeks

Assess and design

Source-water testing, cluster mapping, tariff and subsidy policy, institutional and O&M model.

PHASE 2

3–4 months

Pilot cluster

One mother plant, 15–20 kiosks, transport, agents, platform tenancy, field acceptance.

PHASE 3

12–18 months

Scale

Cluster-by-cluster replication, operations desk, government oversight dashboard, independent quality audit cycle.

PHASE 4

Ongoing

Sustain

Preventive maintenance, OTA updates, revenue reconciliation, coverage and outcome reporting.

Next: a live demonstration of the Andhra Pradesh deployment, a site visit to a running cluster, and a scoped pilot for your department.

IN SUMMARY

Proven. Measured. Accountable.

Proven

9 years, 413 units, 1.61 million transactions

Beneficial

Safe RO water inside the habitation; AP tariff Rs 2 / 20 L

Monitored

TDS, pH and unit health, centrally and continuously

Remote

Configuration, calibration and firmware from the center

Accountable

No cash at the tap; three records that must agree

Ready

IoT controllers, cloud platform, field tools — in production

We would welcome a live demonstration, a site visit to a running cluster, and a scoped pilot in a district of your choosing.

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Thank you