

9th India International Water Week 2026 · PF-8

Rural-Urban Water Grid for Sustainable Water Management

The Telangana Experience

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Climate Resilient Water Management · MR-6, Bharat Mandapam · 25 Sep 2026



Water Grids and Used Water in a Climate Resilient Frame



1

Source Security

Dependable surface water from Krishna and Godavari in place of failing aquifers

2

Seamless Service

Rural, peri-urban and urban supply planned as one continuum

3

Circular Used Water

From “treat and dispose” to “treat, recover and reuse”

What Is a Rural-Urban Water Grid?

A regional, interconnected system linking sources, treatment, bulk transmission, storage and distribution across administrative boundaries — serving villages, towns and industry through one corridor.



Sources

Krishna & Godavari reservoirs

Treatment

Treated at source

Bulk Transmission

98% by gravity

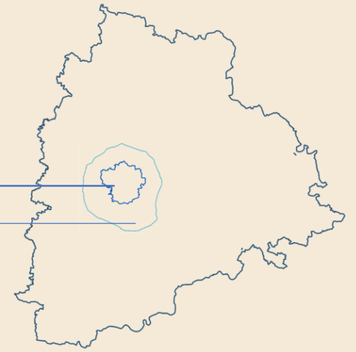
Storage

Village service reservoirs

Distribution

Rural · ULBs · industry

Telangana Urban Profile: CURE, PURE and RARE



135 ULBs

12 Corporations

123 Municipalities



CURE

Core Urban Region Economy

2,053 km² · 1.68 Cr people · 3 ULBs

Services, innovation, high-end economy



PURE

Peri-Urban Region Economy

9,281 km² · 11.05 lakh people · 26 ULBs

Manufacturing, logistics, industry



RARE

Rural and Agri Region Economy

1,00,743 km² · 106 ULBs

Agriculture, rural economy, green growth



Telangana's Case

Mission Bhagiratha

53lakh

Rural household tap connections

1.5lakh km

Pipeline network

100	135	150
LPCD Rural	Municipalities	Corporations

Integrates sources, intakes, treatment plants, bulk transmission, reservoirs, distribution networks and household connections into one system across rural and urban areas.

01 · Rural-Urban Water Grids

Water Supply Status in ULBs

Daily supply across 135 ULBs

1,257.28 MLD



Balance from other local sources · reviewed daily by EnC (PH&MED)

Institutional Roles

Public Health Dept. plans and builds; assets handed to ULBs for O&M

Mission Bhagiratha supplies treated water to ULB tapping points

Commissioners monitor daily; both Engineers-in-Chief review statewide

31 lakh

House service connections

33

Districts served

01 · Rural-Urban Water Grids

Daily Monitoring of ULB Water Supply

EnC (PH&MED) · Water Supply Snapshot

Daily supply across all ULBs

1,257.28 MLD

33 Districts

135 ULBs

SUPPLY BY SOURCE



Mission Bhagiratha grid	796.73 MLD	63.4%
Own sources	437.03 MLD	34.8%
HMWSSB	5.72 MLD	0.5%

31.00 lakh

House service connections

DAILY REVIEW CYCLE

1. Bulk supply metered at ULB tapping points
2. Commissioners report ULB supply daily
3. EnC (PH&MED) and EnC (MB) review statewide

03 · Innovation · STP Case Study

Warangal – Pragathi Nagar: Performance → Advanced Treatment

15 MLD STP · Commissioned 2024

15 MLD installed

4+ Star Jal Hi Amrut

₹2 Cr incentive

2 MLD tertiary plant

WHAT WORKED

- 4+ Star performance under Jal Hi Amrut
- ₹2 crore incentive received
- Incentive reinvested in a 2 MLD tertiary treatment plant
- Existing treated water reused for municipal activities

IMPACT

- Performance funding converted into the next treatment level
- A pathway from basic treatment to higher-quality reuse
- Reinvestment rather than one-time project completion



Learning: Performance-linked incentives can finance the next stage of treatment and resource recovery.

03 · Innovation · STP Case Study

Warangal – Ursu Gutta: Monitoring + Renewable Energy + Reuse

5 MLD STP · Commissioned 2024

5 MLD installed

3+ Star Jal Hi Amrut

₹0.75 Cr incentive

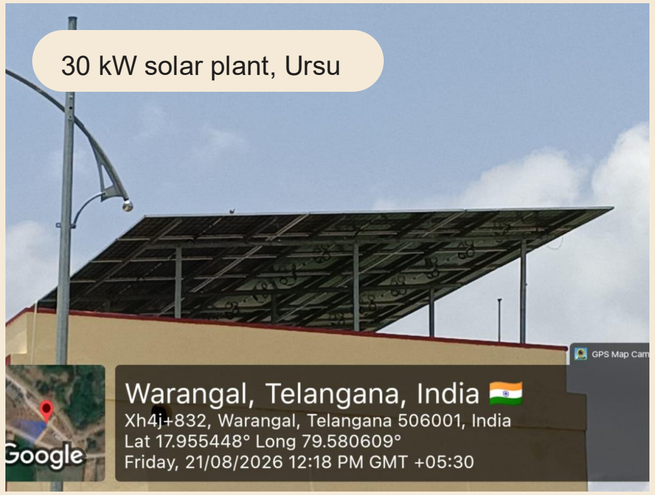
30 kW rooftop solar

WHAT WORKED

- 3+ Star performance under Jal Hi Amrut
- Incentive used for OCEMS and rooftop solar
- Treated water reused for plantation and municipal works
- Next: tertiary treatment and external offtake

IMPACT

- Continuous effluent monitoring strengthens compliance
- Solar reduces recurring operating burden
- Existing reuse is a base for industrial / institutional supply



Learning: Link monitoring, renewable energy and reuse — each strengthens STP sustainability.

03 · Innovation · STP Case Study

Karimnagar: Reuse and Service Delivery Around an Under-Utilised STP

38 MLD STP · MBBR · UIDSSMT

38 MLD installed

~3 MLD treated

3,544 house connections

285 km network laid

WHAT WORKED

- Treated water reused for median / plantation
- Water Plus status under SBM
- 1442 septic-tank service helpline
- Mechanised sewer cleaning; no manual entry
- SCADA / automation being installed

IMPACT

- Service practices improve sanitation while network use grows
- Reuse gives treated water an immediate local use
- Mechanisation improves worker safety



Reuse at central median plantation

Learning: Measure success by sewage actually collected and treated — while building services and local reuse.

03 · Innovation · STP Case Study

Nalgonda: Comprehensive Revival of an Existing Public Asset

17.16 MLD STP · Waste Stabilisation Pond · Commissioned 2019

17.16 MLD installed

~80 acres existing site

2025 revival completed

WHAT WORKED

- Inlet gates, screens, pumps and pipelines restored
- Electrical systems, control panels and standby power restored
- Treatment ponds and access facilities rehabilitated
- Flow meters / pressure gauges provided
- Component-wise testing before handover

IMPACT

- Existing asset restored rather than replaced
- Performance can now be measured systematically
- Platform for nala interception, household connections, O&M and reuse

Learning: Diagnose the existing asset first; rehabilitation can be faster and cheaper than premature replacement.

03 · Innovation · Reuse of Treated Water

Vikarabad and Siddipet Sell and Reuse Treated Water



Vikarabad

13 MLD MBBR · Chakali Gadda

MoU with local construction firms · minimum ₹5 lakh a year



Siddipet

7.25 MLD MBBR · Chintala Cheruvu

Plantation, parks, nursery · balance returned to the lake

7.5 MLD reused daily

96% capacity used

₹5 L+ annual revenue

2 ULBs loop closed

Warangal Turns Star Ratings into New Capacity



Ursu · 5 MLD SBR ₹0.75 Cr

Incentive funds online effluent monitoring (OCEMS) and 30 kW rooftop solar



Pragathi Nagar · 15 MLD SBR ₹2.00 Cr

Jal Hi AMRUT incentive funds a new 2 MLD tertiary treatment plant

Next: treated water sales to the Railway Coach Factory and Kakatiya Mega Textile Park

02 · Used Water Management · Urban Challenge Fund

Greater Warangal Comprehensive UGSS

₹4,675Cr

Phase I sanctioned · tri-cities of Warangal, Hanamkonda, Kazipet

25%	25%	50%
Centre · UCF **₹1,169 Cr**	State **₹1,169 Cr**	External assistance **₹2,337 Cr**

Sewer Network

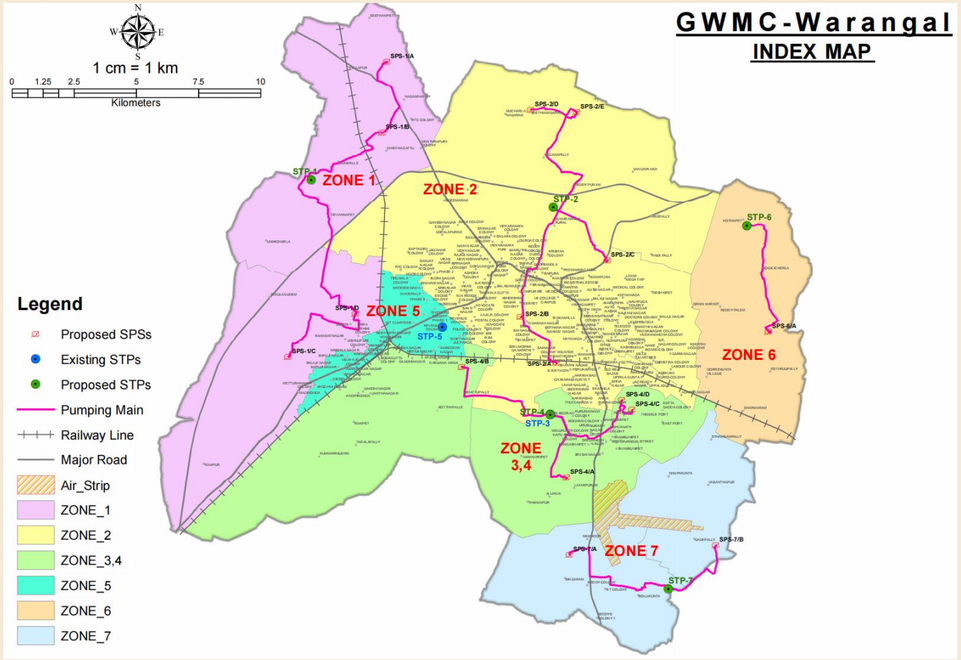
City-wide underground sewerage

Stormwater

Relief from open drains and flooding

Treat & Reuse

Treated water to industry and railways



Warangal Has a Ready Market for Treated Water

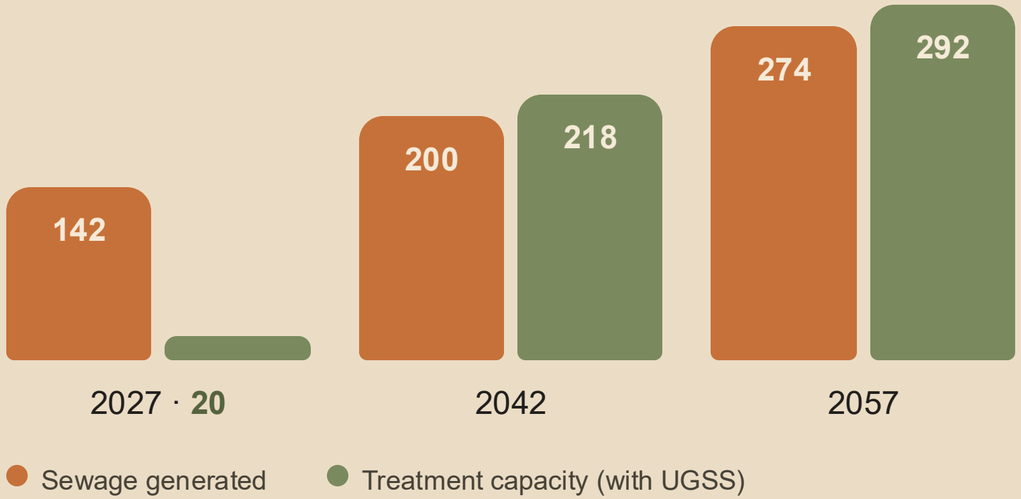
88%↑ sewage by 2057

67% users willing

40% from borewells

52.6% demand in top 10%

SEWAGE GENERATED VS TREATMENT CAPACITY (MLD)



ASSESSED REUSE DEMAND (MLD)

Irrigation	~94
Institutions	4.96
Landscaping	~4
Rail & bus depots	1.8–3.7
Waste operations	0.32

Irrigation bar not to scale · small-segment bars scaled to 22 MLD

Survey of 100 of 781 bulk users · 119 government connections are the cleanest anchor contracts — hospitals alone are half

04 · Policy · Stakeholder Consultation

A Policy Built With Its Users

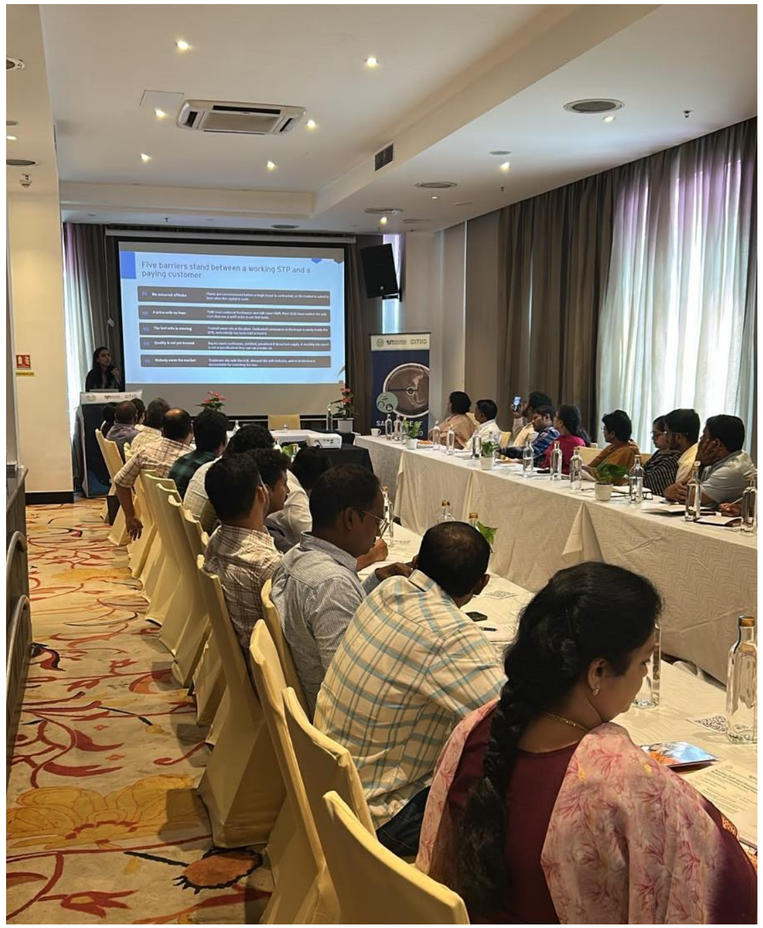
Scaling Safe & Sustainable Reuse of Treated Used Water · 21 September 2026



ULB engineers

Bulk water users

NIUM · CITIIS



IN DISCUSSION

Five barriers between a working STP and a paying customer

Telangana Policy · Reuse · Resource · Resilience

Policy on Safe Reuse of Treated Used Water, 2026

VISION

“Transform treated used water into a strategic resource for water security, growth, resilience and a circular water economy.”

Ma Neeru · Our Water

1 Water Security

TUW as a reliable source augmenting supply

2 Safe Reuse

Fit-for-purpose reuse that protects public health

3 Freshwater Conservation

Substitute freshwater for non-potable uses

4 Circular Economy

Recover water, nutrients and energy

5 Environmental Protection

Restore rivers, lakes and urban water bodies

6 Climate Resilience

Buffer against drought and variability

Telangana Policy · Targets

Time-Bound Targets under the Policy

By 2030

80%
treatment
20%
minimum reuse

Reuse Action Plans and Command Areas notified by all ULBs

By 2035

90%
treatment
50%
minimum reuse

No-Freshwater Zones notified where TUW supply is ready

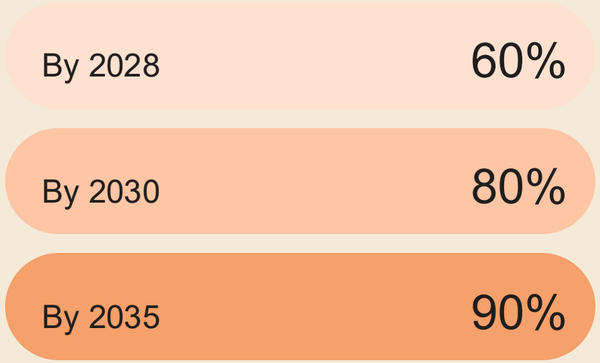
By 2047

100%
treatment
100%
minimum reuse

All TUW reused, recovered or put to environmental use

Industry

Share of certified substitutable demand



New Bulk Users

Residential societies 20% → 50% by 2030-31; institutional and commercial 20% → 40%

Telangana Policy · Key Shifts

Key Policy Shifts under the 2026 Policy

~~Wastewater~~	→	Used Water	A shared public resource of the State
~~Sewage Treatment Plant~~	→	Water Resource Recovery Facility	Recovery of water, nutrients and energy
~~Treat and dispose~~	→	Reduce, Reuse, Recover, Recharge	Discharge only as a last resort
~~Freshwater for all uses~~	→	Freshwater for potable use	TUW preferred for non-potable uses
~~Voluntary reuse~~	→	Mandatory for notified users	Binding on industry, power, bulk and municipal users
~~Unplanned supply~~	→	Notified Reuse Command Areas	Assured quantity, quality and contingency
~~Budget-dependent O&M~~	→	TUW priced as an economic good	Revenues ring-fenced for O&M and expansion
~~Unverified reuse~~	→	Portal registration and returns	Tradable certificates; public data

Obligations and Institutional Framework

ULBs

- Reuse Action Plan
- Reuse Command Area per WRRF
- Annual TUW declaration
- Municipal operations on TUW

Operators

- Deliver agreed quantity and quality
- Risk Management Plan per scheme
- Suspend supply on barrier failure
- Penalties for non-compliance

Industry & Power

- Water audits of substitutable demand
- Thermal plants use TUW by proximity
- Data centres adopt TUW for cooling
- CTO linked to TUW use

Bulk Users

- On-site D-WRRFs for new premises
- Dual plumbing and metering
- Extended User Responsibility
- Government estates lead

Steering Committee · Principal Secretary, MA&UD

District Task Force · District Collector

Centre of Excellence · NIUM

03 · Innovations

Telangana's Innovation Toolkit

1

SCADA Monitoring

Real-time STP performance and reservoir-to-tap flow tracking

2

Ratings to Reinvestment

Star-rating incentives ploughed back into plant upgrades

3

Treated Water Sales

MoUs with builders and industry create a revenue stream

4

Gravity-First Design

98% of the Bhagiratha network flows by gravity

5

Hybrid Annuity Model

Long-term O&M bundled into STP and FSTP contracts

6

Scheme Convergence

AMRUT 2.0, SBM (U) 2.0 and UCF combined for used water

Way Forward

~~Treat and Dispose~~ → Treat, Recover and Reuse

- Mission Bhagiratha as a replicable rural-urban grid model
- 115 STPs (455 MLD) in 101 non-sewered ULBs · SBM (U) 2.0
- GWMC UGSS Phase I (₹5,257 Cr) under the Urban Challenge Fund
- 55 STPs (1,174 MLD) with sewer networks in 12 ULBs · AMRUT 2.0
- SCADA for real-time STP performance management
- Policy on Safe Reuse of TUW, 2026 — 100% reuse by 2047



Lessons

Transferable Lessons for States and AMRUT 2.0

1. Plan supply at state scale, across the rural-urban line
2. Deliver bulk treated water to ULB boundaries; let ULBs distribute
3. Pair every supply augmentation with treatment capacity
4. Reward plant performance and reinvest the incentive
5. Price and market treated water to create reuse demand



Thank You

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IIWW 2026 · Climate Resilient Water Management