

# Mission Bhagiratha

## Telangana's Integrated Digital Water Network

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**M**ission Bhagiratha is a flagship drinking water initiative of the Government of Telangana, designed to deliver safe, treated piped water to every household in the State. Covering nearly 10 million citizens across 5.5 million households, it represents one of the largest centralized rural water supply networks in the world.

At this scale, infrastructure alone is not enough—what becomes equally critical is visibility, traceability, and the ability to govern the system in real time.

To address this, the State has implemented an advanced Enterprise WebGIS-based Water Infrastructure Management System. The platform serves as a statewide spatial decision-support system, providing end-to-end visibility across the water supply value chain—from source to service delivery. In doing so, it establishes Telangana as a national benchmark in technology-enabled water governance.

### An Integrated Digital Water Network Architecture

The Enterprise WebGIS platform provides end-to-end geospatial visibility of the entire water supply value chain—from raw water abstraction



Mission Bhagiratha's Enterprise WebGIS platform transforms rural water supply into a data-driven governance system. By integrating geospatial asset mapping, habitation-level monitoring, real-time analytics, and national platform linkages, it enables end-to-end visibility, improves service reliability, and establishes a scalable, replicable model for technology-enabled public infrastructure management.



to last-mile household distribution. It integrates and spatially maps all critical infrastructure components within a unified digital environment, enabling a comprehensive view of system design and operations.

The system brings together the following infrastructure layers:

#### Source and Bulk Water Infrastructure

Surface water reservoirs

- Intake wells and intake structures
- Raw water transmission mains
- Water Treatment Plants (WTPs)

#### Treated Water Storage & Regulation

- Sumps
- Ground Level Balancing Reservoirs (GLBRs)
- Break Pressure Tanks (BPTs)
- Overhead Balancing Reservoirs (OHBRs)
- Overhead Service Reservoirs (OHSRs)

#### Conveyance & Distribution Network

- Gravity mains

- Pumping mains
- Pumping stations and electromechanical assets
- Control valves and pressure regulation systems
- In-village distribution networks
- Functional Household Tap Connections (FHTCs)

By integrating these components within a single geospatial framework, the platform enables seamless visualization of the network, supports system-level understanding, and provides a reliable foundation for planning, monitoring, and operational management.

### Zoning-Based Network Governance Model

By integrating hydraulic conveyance components with administrative and habitation boundaries, the system enables end-to-end traceability of the water supply chain—from source sustainability to the consumer endpoint.

The WebGIS application incorporates multi-tier administrative boundaries—Segment, District, Mandal, Constituency, and Habitation—systematically linked to corresponding service reservoirs. This structured geospatial architecture provides a consistent framework for planning, monitoring, and governance of the water supply network.

Through this zoning-based configuration, officials can compare system performance across regions, reinforce accountability through clearly defined spatial jurisdictions, identify service deficiencies and distribution imbalances, and take timely, data-driven decisions.

By linking administrative hierarchies with habitation-level spatial datasets within a unified geospatial environment, the platform establishes a coherent spatial intelligence layer. This integration has significantly improved operational efficiency while strengthening evidence-based infrastructure planning under Mission Bhagiratha.

### Advanced Functional Capabilities

#### End-to-End Network Coverage Analytics

The GIS platform enables full network tracing from intake structures to habitation-level endpoints. Engineers can assess service coverage



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## Source and Intake Infrastructure

- 32 Surface Water Sources
- 78 Intake Structures

## Treatment & Storage Infrastructure

- 123 Water Treatment Plants (WTPs)
- 775 Sumps
- 190 Ground Level Balancing Reservoirs (GLBRs)
- 210 Break Pressure Tanks (BPTs)
- 691 Overhead Balancing Reservoirs (OHBRS)
- 36,473 Village OHSRs

## Network Infrastructure and Coverage

- 1.35 lakh km of pipeline network
- 292 Bulk Water Supply connections
- Coverage of approximately 2.4 crore population

This extensive geospatial repository provides a unified and reliable data foundation, enabling coordinated infrastructure management and informed decision-making at all administrative levels.

## Integration with National-Level Digital Platforms

The WebGIS platform is integrated with the PM Gati Shakti National Master Plan (NMP) Portal, enabling structured geospatial data exchange and standardized integration of pipeline network layers into the national infrastructure framework.

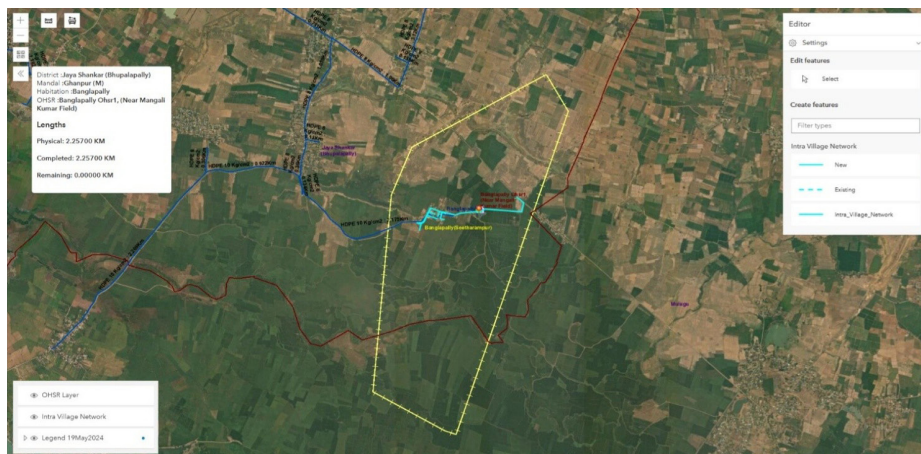
This integration facilitates alignment between State-level infrastructure systems and national planning initiatives, ensuring greater coherence in infrastructure development.

Seamless interoperability with the Gati Shakti platform also supports coordinated, multi-sectoral planning across key domains such as roads, power, irrigation, and telecommunications. By situating water infrastructure within a broader national geospatial ecosystem, the platform strengthens cross-departmental collaboration and integrated decision-making.

## Transparency & Accountability

The deployment of GIS-enabled mapping

▼ Fig 9.3 : Intra-Village Water Supply Network



I am pleased to share that the Mission Bhagiratha Department is advancing towards digital transformation. The Mission Bhagiratha WebGIS-based Water Infrastructure Monitoring System has emerged as a powerful governance tool, strengthening our ability to plan, monitor, and manage the State's drinking water supply system.

The WebGIS application offers end-to-end spatial visualization of drinking water infrastructure, from surface water sources to the habitation level, enabling effective asset monitoring and long-term sustainability. A key achievement under this initiative is the digitization of nearly 65,000 kilometers of in-village pipeline network within a short timeframe by our field engineers, in accordance with National Jal Jeevan Mission (NJJM) guidelines.

Advanced features such as functionality-wise asset dashboards, Water Quality Laboratories information, and Water Supply Status dashboards have significantly enhanced transparency, monitoring, and data-driven decision-making.

The platform has become an indispensable instrument of governance, aligning seamlessly with the Department's vision of providing daily potable drinking water to every rural household in Telangana. Its integration with the Irrigation Department's reservoir water level data and its linkage of asset information with the PM GatiShakti National Master Plan Portal reflect effective multi-departmental coordination.

I place on record my sincere appreciation for the support and technical expertise extended by NIC, Hyderabad, whose contributions were vital to the successful implementation of this initiative.



**Shri G. Krupakar**, Engineer-in-Chief (ENC), HoD Mission Bhagiratha, Government of Telangana

and analytical dashboards has strengthened transparency in system monitoring and service delivery. By providing access to reliable, location-based data, the platform enables more consistent and evidence-based oversight across administrative levels.

With role-based access to verified geospatial information, decision-makers can monitor infrastructure performance and service status in near real time. This improves traceability of assets and operations, supports timely identification of service gaps, and enables more accountable, outcome-oriented governance.

By shifting from fragmented reporting to a unified spatial data framework, the system enhances

both visibility and institutional accountability in rural water supply management.

## Conclusion

The Mission Bhagiratha WebGIS platform represents a comprehensive, technology-enabled framework for next-generation water governance. By integrating end-to-end asset geotagging, habitation-level service monitoring, real-time analytical dashboards, high-resolution satellite imagery, water quality surveillance, and interoperable data linkages, the platform has significantly strengthened the planning, monitoring, and management of rural water supply infrastructure.

More importantly, it demonstrates a shift from static infrastructure management to a dynamic, data-driven governance model. The ability to visualize, analyze, and monitor the entire water supply network within a unified geospatial environment has improved operational efficiency, enhanced service reliability, and enabled more responsive decision-making.

As a scalable and interoperable system, the platform offers a replicable model for other states and sectors seeking to adopt geospatial technologies for large-scale public service delivery.

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