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GOVERNMENT OF TAMIL NADU
2026

[Regd. No. TN/CCN/467/2012-14.
[R. Dis. No. 197/2009.
[Price: Rs. 17.60 Paise.

TAMIL NADU GOVERNMENT GAZETTE

PUBLISHED BY AUTHORITY

No. 35] CHENNAI, WEDNESDAY, SEPTEMBER 2, 2026
Aavani 16, Parabhava, Thiruvalluvar Aandu–2057

Part II—Section 1

Notifications or Orders of specific character or of particular interest to the public issued by Secretariat Departments.

NOTIFICATIONS BY GOVERNMENT

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MUNICIPAL ADMINISTRATION AND WATER SUPPLY DEPARTMENT

[Jal Jeevan Mission – Commissioning and Handing-over Protocol & Community Ownership for Rural Piped Water Supply Schemes under Jal Jeevan Mission in Tamil Nadu–Guidelines – Approved – Orders–Issued. 38-80

NOTIFICATIONS BY GOVERNMENT

MUNICIPAL ADMINISTRATION AND WATER SUPPLY DEPARTMENT

No. II(1)/MAWS/17/2026.

[Jal Jeevan Mission – Commissioning and Handing-over Protocol & Community Ownership for Rural Piped Water Supply Schemes under Jal Jeevan Mission in Tamil Nadu–Guidelines – Approved – Orders–Issued.]

The following Government Order is Published:-

[G.O. Ms. No.160, Municipal Administration and Water Supply (WS.1), 19th August 2026, ஆவணி 2, பராபவ, திருவள்ளுவர் ஆண்டு–2057.]

Read:-

1. From the Under Secretary, Department of Drinking Water and Sanitation, National Jal Jeevan Mission, Letter No. WQ-11031 / 14 / 2025 – WQ – DDWS, dated.27.10.2025.

2. From the Mission Director, Jal Jeevan Mission and Managing Director, Tamil Nadu Water Supply and Drainage Board, Letter No.30925/Quality Assurance/AE/JJM/ 2025-1/ dated.07.11.2025.

3. The Under Secretary, Department of Drinking Water and Sanitation, National Jal Jeevan Mission, Letter No. WQ-11031 / 14 / 2025 – WQ – DDWS, dated.19.11.2025.

4. From the Mission Director, Jal Jeevan Mission and Managing Director, Tamil Nadu Water Supply and Drainage Board, Letter No.30925/Quality Assurance/AE/JJM/ 2025-1, dated.26.11.2025.

5. The Under Secretary, Department of Drinking Water and Sanitation, National Jal Jeevan Mission, Letter No. W-11045 / 1 / 2025 – JJM-II – DDWS- Part (1), dated.09.04.2026.

6. From the Mission Director, Jal Jeevan Mission and Managing Director, Tamil Nadu Water Supply and Drainage Board Letter No.30925/Quality Assurance/AE/JJM/ 2025, dated.22.05.2026.

ORDER:-160, Municipal Administration and Water Supply (WS.1),19th August 2026.

In the letter sixth read above, the Mission Director, Jal Jeevan Mission and Managing Director, Tamil Nadu Water Supply and Drainage Board has stated as follows:

- In the letter first and third read above, the Government of India has issued the guidelines and protocol for commissioning and handling over of rural water supply schemes to ensure standardized procedures, accountability, and sustainable service delivery.

- The protocol provides procedures relating to testing and commissioning, quality assurance, certification, asset handing over, fixation of Operation and Maintenance responsibilities, and post-commissioning service delivery mechanisms.

- Accordingly, in the letter second and fourth read above, the same has been communicated to all the District Collectors, Chief Engineers of Tamil Nadu Water Supply and Drainage Board for compliance and to ensure that the aforementioned guidelines are disseminated to Gram Panchayats and sub committees.

- Subsequently, during the review meeting conducted by the Additional Secretary and Mission Director, National Jal Jeevan Mission on 07.04.2026, it was instructed that the Commissioning and Handing Over Protocol shall be adopted through a Gazette Notification. Further, the same has been mandated for completion by August 2026 under Serial No. 2.3.1 of the Reform Matrix Table of the Operation Guidelines of Jal Jeevan Mission 2.0.

2. In light of the above, the Mission Director, Jal Jeevan Mission and Managing Director, Tamil Nadu Water Supply and Drainage Board has submitted the draft Commissioning & Handing Over Protocol based on the guidelines issued by the National Jal Jeevan Mission, Government of India and has requested the Government to issue necessary Government Order / Gazette Notification for adoption and implementation.

3. The Government, after careful examination of the proposal of the Mission Director, Jal Jeevan Mission and Managing Director, Tamil Nadu Water Supply and Drainage Board, have decided to approve the Guidelines for Commissioning (Annexure-I) and Handing-over Protocol and Community Ownership (Annexure-II) as annexed to this order, for implementation of Rural Piped Water Supply Schemes under Jal Jeevan Mission in Tamil Nadu.

4. The Mission Director, Jal Jeevan Mission and Managing Director, Tamil Nadu Water Supply and Drainage Board is directed to take appropriate further action in this regard.

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Abbreviations

S. No	*Abbreviation*	*Full Form / Meaning*
1	ASHA	Accredited Social Health Activist
2	AWC	Anganwadi Centre
3	BIS	Bureau of Indian Standards
4	CAD	Computer-Aided Design
5	CPHEEO	Central Public Health and Environmental Engineering Organization
6	DDWS	Department of Drinking Water and Sanitation
7	DPD	Diethyl-p-phenylenediamine (Chemical method used for chlorine testing)
8	DPR	Detailed Project Report
9	E.coli	Escherichia coli
10	ESR	Elevated service reservoir
11	FHTC	Functional Household Tap Connection
12	HMI	Human-Machine Interface
13	IEC	Information, Education and Communication
14	IoT	Internet of Things
15	ISO	International Organization for Standardization
16	JJM	Jal Jeevan Mission
17	LPCD	Litres Per Capita per Day

S. No	*Abbreviation*	*Full Form / Meaning*
18	mg/l	Milligram per litre
19	MVS	Multi-Village Scheme
20	NJJM	National Jal Jeevan Mission
21	NJMP	Nal Jal Mitra Programme
22	NTS	National Topographic System
23	O&M	Operation and Maintenance
24	PIA	Project Implementation Agency
25	PMDc	Maximum Operating Pressure of the System (Design calculation variable)
26	ppm	Parts Per Million
27	PST	Pressure to which a pipeline or pipeline section is subjected for testing purposes
28	PW	Highest Pressure occurring continuously under stable operating conditions without surge
29	PWS	Piped Water Supply
30	RCL	Residual Chlorine Level
31	RPWSS	Rural Piped Water Supply Scheme
32	SCADA	Supervisory Control and Data Acquisition
33	SVS	Single Village Scheme
34	VP	Village Panchayat
35	VWSC	Village Water and Sanitation Committee
36	WHO	World Health Organization
37	WQMIS	Water Quality Management Information System

Annexure-1

Guidelines for Commissioning of Rural Piped Water Supply Schemes (RPWSS)

1. Preamble

The Government of Tamil Nadu, in alignment with the National Jal Jeevan Mission (NJJM) guidelines of the Department of Drinking Water and Sanitation (DDWS) under the Ministry of Jal Shakti, is implementing Rural Piped Water Supply Schemes (RPWSS) across the State to ensure sustained, long-term delivery of potable drinking water to every rural household through Functional Household Tap Connections (FHTCs); AND WHEREAS this ambitious program necessitates robust commissioning protocols that ensure sustainable service delivery, community acceptance, and long-term operational viability. The commissioning phase represents a critical bridge between infrastructure construction and service commencement, where systematic validation procedures determine whether substantial public investments translate into reliable water supply services for rural communities. These Guidelines align with the JJM Operational Guidelines, CPHEEO Manual 2024, and BIS norms to institute an objective, transparent, and multi-tiered verification framework.

2. Objective

The primary objective of these Guidelines are to establish a standardized, transparent, and technically rigorous 13-week (3-month) framework for the validation, testing, trial-running, and institutional handover of Rural Piped Water Supply Schemes (RPWSS).

Specific objectives include:

- **Infrastructure Accountability:** Ensuring all civil, electrical, mechanical, and instrumentation works strictly comply with approved Detailed Project Reports (DPRs) and Bureau of Indian Standards (BIS).
- **Technical Validation:** Providing empirical proof of system hydraulic integrity, water quality safety, and electromechanical efficiency under actual load conditions.
- **Community Stewardship:** Transitioning management from project execution teams to local governance bodies (VPs/VWSCs) with adequate training, operational manuals, and absolute clarity on system ownership.
- **Digital Baseline Integration:** Integrating geo-tagged asset maps with national monitoring platforms for lifecycle management and predictive maintenance.

3. Scope & Applicability

These Guidelines are universally applicable to all implementing agencies, contractors, third-party verification bodies, and community institutions involved in the operationalization of:

- **Single Village Schemes (SVS):** Schemes relying on local groundwater or surface water sources managed directly by Village Panchayats (VPs) or Village Water and Sanitation Committees (VWSCs).
- **Multi-Village Schemes (MVS):** Shared regional systems connecting multiple communities to bulk water transfer infrastructures, transmission networks, and centralized water treatment facilities.

Operational Boundaries

- **Out-Village Infrastructure:** Encompasses water transfer from raw water sources/intakes to treatment plants, major transmission mains to master balancing reservoirs, and storage facilities up to the village-level distribution points.
- **In-Village Infrastructure:** Encompasses localized distribution networks, overhead reservoirs, control valves, and functional household tap connections (FHTCs) within the distinct village boundary.

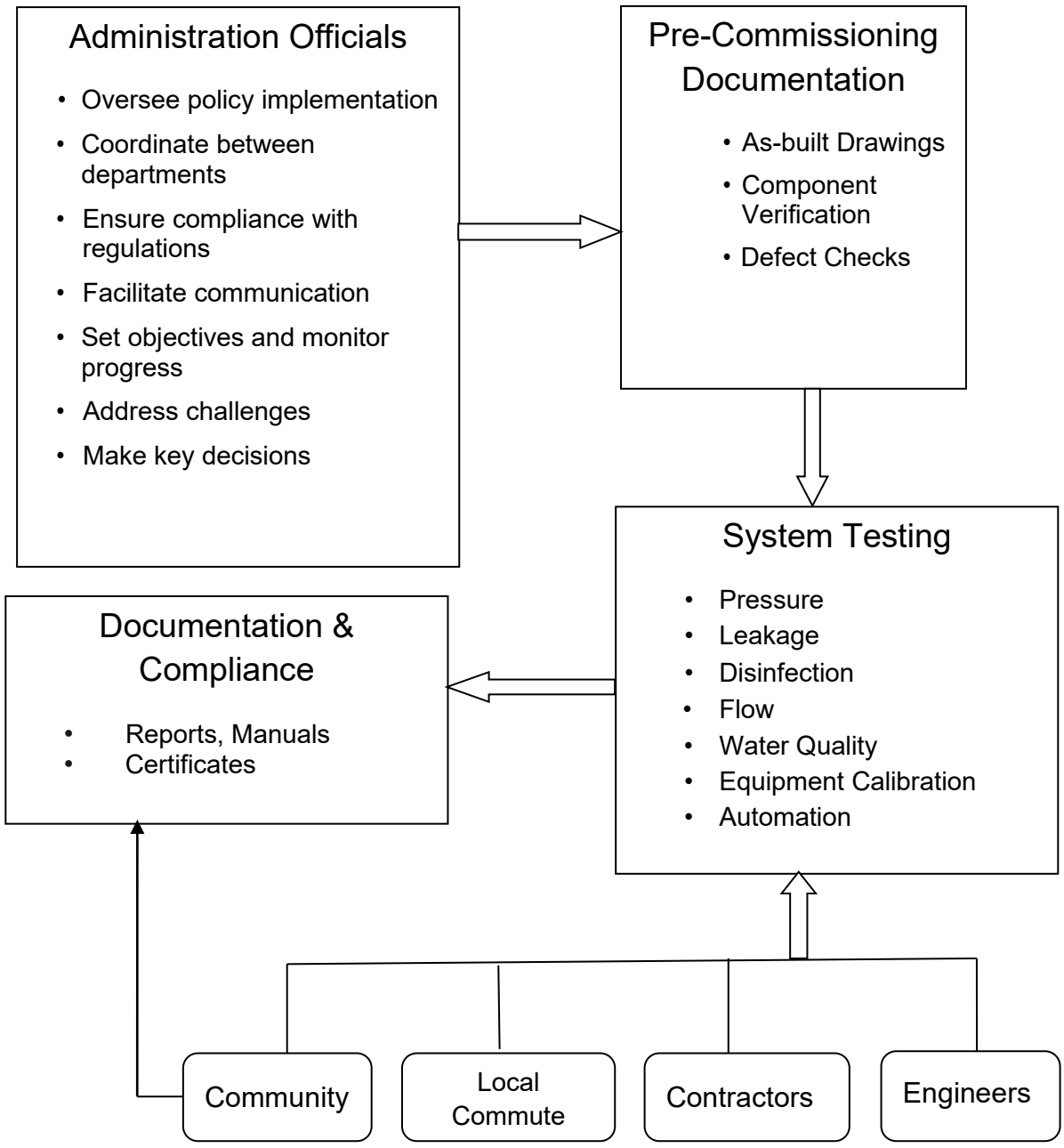
4. Expected Outcomes

- **Zero-Defect Operational Assets:** Verification of leak-free pipelines and fully operational electro-mechanical systems.
- **Equitable Service Delivery:** Empirical validation of the delivery of exactly 55 LPCD (litres per capita per day) of water at all points, including tail-end households, with a minimum residual head of 7 meters.
- **Water Quality Compliance:** 100% compliance with BIS 10500:2012 water quality standards with zero tolerance for microbial indicators (E.coli and total coliform).
- **Institutional Empowerment:** Trained and legally authorized VWSCs taking full custody of the system with customized O&M manuals in local languages.
- **Real-Time Data Mapping:** 100% geo-tagged infrastructure recorded under the RPWSS registry and synchronized with the PM Gati Shakti platform.

5. The Four-Phase Commissioning Framework (Timeline: 13 Weeks)

Phase 1: Pre-Commissioning Documentation (Weeks 1-3)
Phase 2: System Testing & Technical Validation (Weeks 3-8)
Phase 3: Trial Run & Community Integration (Weeks 9-11)
Phase 4: Documentation, Compliance & Handover (Weeks 11-13)

5.1 FLOW CHART FOR COMMISSIONING PROCESS



5.2 Phase 1: Pre-Commissioning Documentation (Weeks 1-3)

This foundational phase establishes infrastructure accountability through meticulous documentation and verification.

Key Activities:

- Finalization of As-built drawings capturing all deviations from original design specifications, including pipe routes, valve locations, pump configurations, treatment plant layouts, and household connection details
- Comprehensive geo-tagged asset mapping for RPWSS (Rural Piped Water Supply Schemes) integration with PM Gati Shakti platform
- Systematic verification of component installation against design specifications and BIS standards
- Visual inspection for defects, leaks, incomplete installations, and damage by independent technical personnel

5.3 Phase 2: System Testing & Technical Validation (Weeks 3-8)

This critical phase involves technical validation and performance verification across multiple parameters.

Key Testing Activities:

Hydrostatic pressure testing for pipe and joints leakage- test pressure at the lowest point of the test section shall be not less than the limit specified in a) or b), whichever is greater.

a) For PW ≤ 10 bar: PST = 1.5 x times PW

b) For PW > 10 bar: PST = PW + 5

c) The maximum PW: PST = PMDc Where,

PW: highest pressure that occurs at a time and a point in the pipeline when operating continuously under stable conditions, without surge;

PST: pressure to which a pipeline or a pipeline section is subjected for testing purposes;

PMDc: maximum operating pressure of the system or of the pressure zone fixed by the designer considering future developments including surge in case of surge is calculated (pumping and water mains).

- Tap connection inspection covering household, community, and institutional connections to ensure leak-free service delivery
- Flushing and disinfection of all water reservoirs and pipelines following CPHEEO manual and WHO guidelines
- Flow and capacity testing to verify 55 LPCD (litres per capita per day) delivery at all points including tail-end households with minimum 7 meters head pressure
- Water quality testing (chemical, biological, physical) by ISO/IEC 17025 accredited laboratories
- Residual chlorine level (RCL) testing ensuring minimum 0.2 ppm at tail-end households
- Electrical and mechanical testing of pumps, motors, valves, sensors, and control systems
- SCADA/automation testing including communication links, cyber-security, and HMI functionality
- Equipment calibration of meters, gauges, and sensors against certified reference standards
- Control system adjustment for optimal operational parameters

5.4. Phase 3: Trial Run & Community Integration (Weeks 9-11)

This phase validates operational readiness and facilitates community integration.

Key Activities:

- Trial operation for 7-14 days minimum under actual demand conditions with continuous monitoring of flow rates, pressure levels, water quality, energy consumption, and service consistency
- System stability monitoring addressing pressure maintenance, flow consistency, and treatment process reliability
- Issue identification and resolution for pressure drops, pump failures, water quality deviations, and control system malfunctions
- Joint inspection with engineers, contractors, Village Panchayat/ VWSC representatives, and community members through transect walks
- IEC (Information, Education, Communication) initiatives for community awareness and residual chlorine acceptance, coordinated with ASHA workers, school programs, and self-help groups

5.5. Phase 4: Documentation, Compliance & Handover (Weeks 11-13)

This final phase ensures institutional accountability and successful handover.

Key Activities:

- Commissioning report preparation with comprehensive testing documentation, results analysis, and recommendations

- Operation manuals development in local languages with visual aids, troubleshooting guides, and maintenance schedules
- Compliance certificates procurement including water quality certificates, pressure test reports, electrical safety certificates, and statutory documents
- VWSC and community training covering basic O&M, water quality monitoring, and emergency response protocols
- Formal system handover to community management with transfer of responsibility documentation

6. Stakeholder Ecosystem

The commissioning process involves 31 distinct stakeholder categories organized across multiple domains:

Government/Regulatory Stakeholders

- JJM Implementation Agency (overall program oversight)
- State/District Implementation Agency (project execution)
- CPHEEO (technical standards and guidelines)
- BIS (standards compliance verification)

Community/Local Governance

- Village Panchayat (local governance and community mobilization)
- VWSC- Village Water and Sanitation Committee (local water management and O&M oversight)
- Community Representatives including women (user feedback and acceptance validation)

Technical/Engineering Teams :

- Project Engineers/Consultants (technical design and commissioning supervision)
- Hydraulic Engineers (flow and pressure validation)
- Electrical & Mechanical Engineers (electromechanical testing)
- Control Systems Engineers (SCADA and automation)
- Water Treatment Specialists (disinfection and quality management)

Quality Assurance :

- Third-Party Verification Agency (independent component verification)
- ISO/IEC 17025 Accredited Laboratory (water quality testing)
- Quality Control Team (ongoing quality monitoring)

Digital/Technology

- RPWSS Digital Infrastructure Team (digital asset mapping and geo-tagging)
- SCADA/Automation Specialists (automation testing and cybersecurity)
- JJM WQMIS Team (water quality data management)

Community Engagement

- NJMP (JJM overall in-village sanchalak)
- IEC Team/Community Mobilizers (awareness campaigns)
- ASHA Workers (health education)
- Capacity Building/Training Team (VWSC training)

6.1. Critical Success Factors

6.1.1. Technical Standards:

- BIS 10500:2012 for water quality with zero tolerance for E. coli and total coli form
- CPHEEO Manual 2024 for technical specifications and testing protocols
- WHO guidelines for residual chlorine (0.2-0.5 mg/L)

6.1.2 Community Participation:

Joint inspection involving all stakeholders ensures transparency, builds community confidence, and facilitates smooth transition to local management. Community acceptance of residual chlorine through effective IEC campaigns is critical for sustained system usage.

6.1.3 Digital Integration:

RPWSS module integration enables real-time monitoring, predictive analytics, and automated functionality assessment, while JJM WQMIS facilitates centralized water quality monitoring with automated alerts.

6.1.4 Deliverables Package

The comprehensive commissioning package includes detailed checklists, stakeholder mapping matrices, timeline summaries, and quick reference guides for standards and acceptance criteria, providing a complete roadmap for systematic implementation that balances technical rigor with community development objectives.

Table 1: KEY ACTIVITIES, LIKELY DURATION AND THEIR PURPOSE

Activities	*Stipulated Time (Approx. Duration In Timeline)*	*Responsibility (Based on Activity Description)*	*Rationale*	*Key Action/Purpose (As per Protocol)*
1. Pre-Commissioning Documentation				
As-built Drawings	(0-3 days)	Contractor/Project Implementation Agency (PIA)	The foundation for all subsequent checks.	Meticulous preparation and verification of drawings to reflect constructed infrastructure.
Component Verification	(1-3 days)	PIA/Third-Party Verification Agency	Components are verified against the finalized drawings	Systematic inspection of all components (pipelines, pumps, tanks, etc.) for compliance with design specifications and quality.
Defect Inspection	(1-7 days)	PIA/Independent Technical Personnel	Must confirm components are in place before inspecting for installation defects.	Visual inspection and systematic assessment for leaks, incomplete installations, or signs of damage to identify potential failure points.
2.System Testing Phase				
Hydrostatic Test	(1-7 days)	PIA/Specialized Testing Team	Pressure testing is critical; cannot proceed if known defects exist.	Pressurizing the pipeline to verify leak-free operation and structural integrity under design pressure conditions.
Water Quality Test	(1-5 days)	Accredited Laboratory / PIA	Water quality is tested only after the pipeline is proven structurally sound and flushed.	Comprehensive physical, chemical, and bacteriological testing to ensure water meets BIS 10500:2012 standards for potable water.
Electrical Testing	(1-5 days)	PIA / Electrical & Mechanical Engineer	Ensures electrical functionality after confirming initial system integrity.	Verification of proper functioning of pumps, motors, valves, sensors, and control systems.
Flow Testing	(1-7 days)	PIA/Hydraulic Engineer	Requires functional pumps/ valves (electrical systems) to test hydraulic flow rates.	Validation of system hydraulic performance to verify designed flow rates and adequate pressure at all delivery points, especially the tail-end.
RCL Testing	(1-2 days)	PIA/Water Quality Team	Residual Chlorine Levels (RCL) must be checked under designed flow and pressure conditions.	Verification of residual chlorine level (RCL) at tail-end households to ensure a minimum of 0.2 ppm for microbiological safety.
Automation Check	(1-7 days)	SCADA/Automation Specialist/PIA	Automation/SCADA is verified after the physical and chemical (RCL) performance is validated.	Validation of SCADA functionality, communication links, remote control functions, and alarm management
Calibration (System Testing Phase / Trial Run Phase)	(1-7 days)	PIA/Instrumentation Specialist	All instruments must be calibrated before the long-duration trial run (Operation Monitor).	Systematic calibration of meters, gauges, and sensors against certified reference standards for accurate measurement and monitoring.

Activities	*Stipulated Time (Approx. Duration In Timeline)*	*Responsibility (Based on Activity Description)*	*Rationale*	*Key Action/Purpose (As per Protocol)*
3.Trial Run Phase				
Operation Monitor	(1-8 days)	PIA/Operational Staff	The long-duration trial run (7-14 days) starts with a fully calibrated system.	Continuous operation for 7-14 days (or more) to validate system stability, efficiency, and consistency under actual conditions.
Issue Identification	(1-7 days)	PIA/Operational Staff	Issues are identified while the system is being monitored and operated.	Systematic identification of operational problems like pressure drops, pump failures, and quality deviations, with root cause analysis and corrective action.
Joint Inspection	(1-7 days)	Engineers, Village Panchayat /VWSC Representatives, Community Members	Stakeholder inspection for formal acceptance occurs during the operational trial.	Collaborative transect walk and formal acceptance to build community confidence and ensure consensus on system readiness for handover.
IEC Initiatives	(1-7 days)	Community Mobilization Team/PIA	Community engagement/ education occurs during the trial run for real-time feedback.	Education and communication initiatives to enhance community awareness and acceptance, particularly of residual chlorine.
4.Documentation & Compliance				
Commissioning Report	(1-7 days)	PIA/Project Manager (Contractor)	The report is the final technical summary, dependent on the completion of the trial run and community acceptance.	Comprehensive final report summarizing all tests, results, observations, and recommendations, the official record of system readiness
Operation Manuals	(1-4 days)	PIA/Technical Writer	Manuals are compiled based on the final operating procedures and troubleshooting identified during the trial run.	Preparation of user manuals, troubleshooting guides, and maintenance schedules tailored to local capacity levels and language.
Compliance Certs	(1-4 days)	PIA/Regulatory Compliance Officer	Final regulatory step; certificates are compiled after all technical and reporting requirements are met.	Collection of formal certificates (Water Quality, Pressure Test, Electrical Safety, etc. for official system commissioning and regulatory authorization)

7. Comprehensive Commissioning Protocol for Rural Piped Water Supply Schemes: An Expanded Framework for Implementation Excellence

The comprehensive analysis presented here references its component of the commissioning from JJM Operational Guidelines, CPHEEO Manual 2024, best practices from national and international agencies such as World Bank, NABARD, NITI Aayog governance frameworks, and the innovative RPWSS digital asset management system. This integrated approach addresses the multifaceted challenges of rural water supply commissioning while establishing a standardized framework that honours both technical requirements and community development objectives.

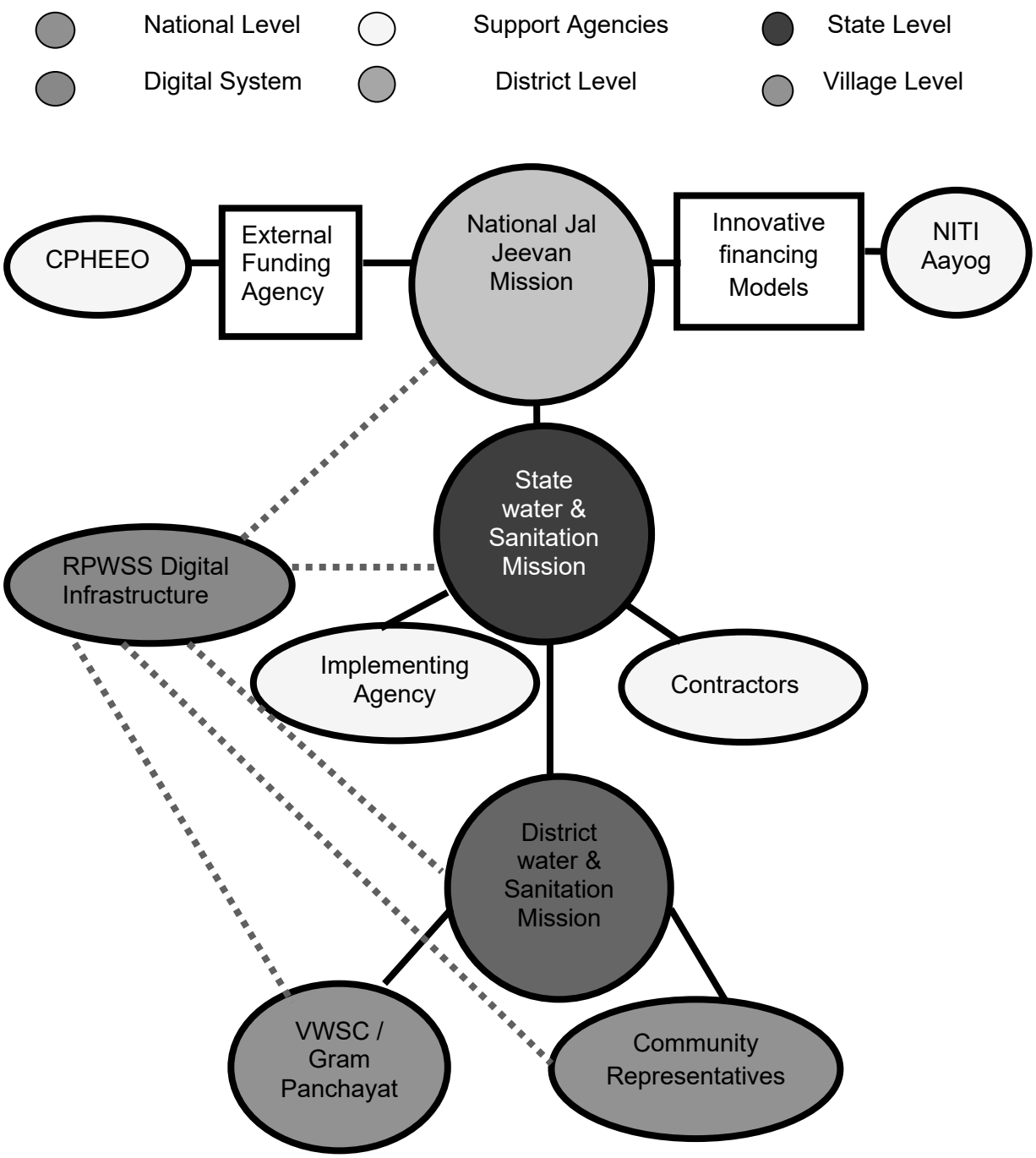


Fig.1: Institutional Framework for Rural Water Supply Commissioning in India

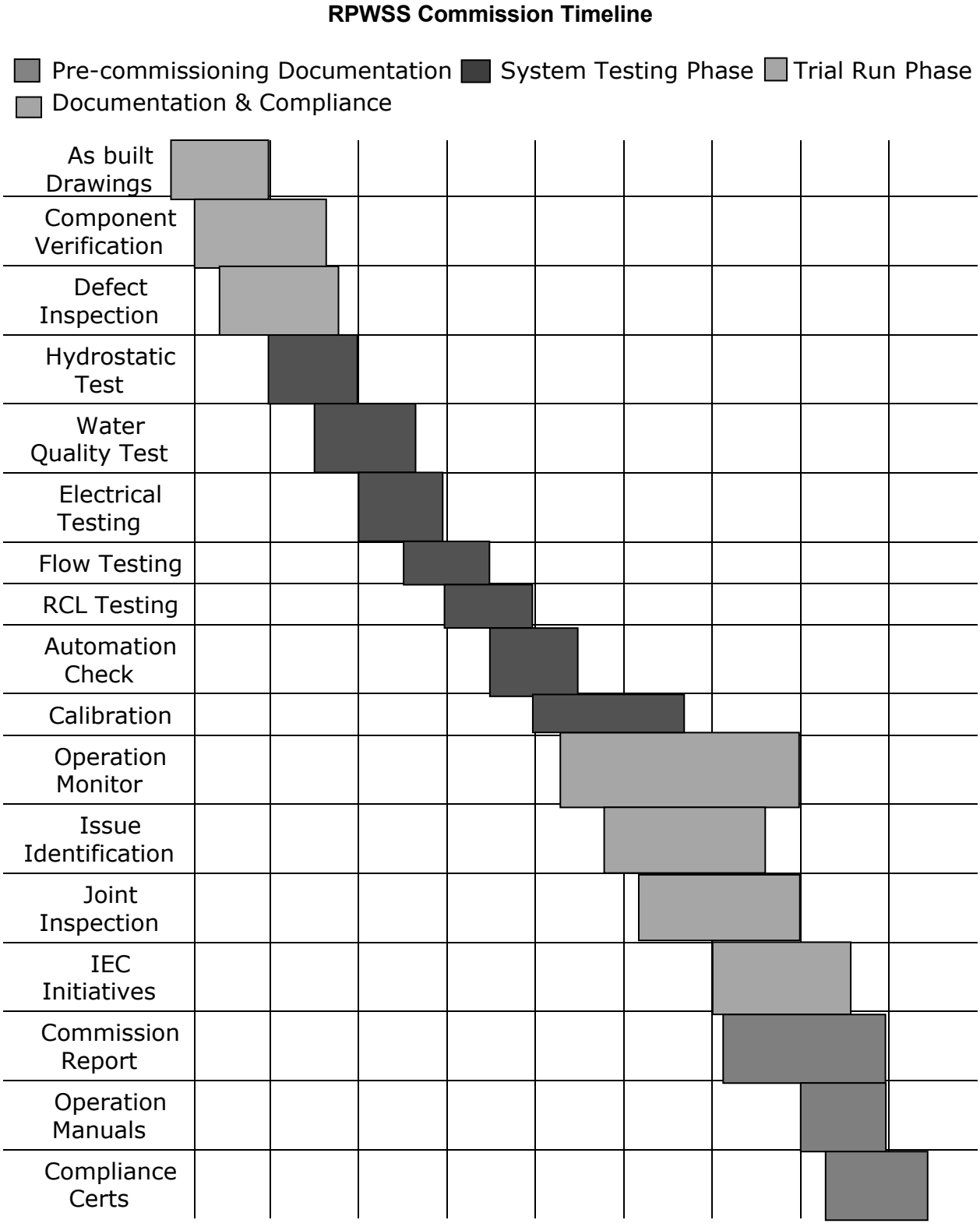


Fig. 2: Commissioning Timeline for Rural Piped Water Supply Schemes

The entire gamut of activities as mentioned in the bar chart above shall be completed in 2 to 13 weeks depending upon the magnitude and coverage area of the scheme.

7.1. Pre-Commissioning Documentation Phase: Establishing Infrastructure Accountability

7.1.1 Finalization of As-Built Drawings for Entire PWS Schemes:

The commissioning process commences with the meticulous preparation and verification of As-built drawings that accurately reflect the constructed infrastructure in its entirety. This documentation phase serves as the foundation for all subsequent testing, operational, and maintenance activities throughout the scheme's lifecycle. As-built drawings must capture every deviation from original design specifications, including modifications made during construction, actual pipe routes, valve locations, pump house configurations, treatment plant layouts along with disinfection units, storage tank positioning, and household connection details. The As-Built drawing shall be submitted in soft (CAD files) and Hard copies. The Map (NTS) showing all critical water supply infrastructure (ESRs, Valves, Bend and Major dia pipes) shall be painted on a wall of prominent places like Panchayat office, Schools or AWCs of the village with relatable landmarks.

The CPHEEO Manual 2024 emphasizes the critical importance of accurate technical documentation for effective operation and maintenance of water supply systems, particularly in rural contexts where technical expertise may be limited. The manual specifies that As-built drawings should include detailed hydraulic profiles, elevation data, pipe material specifications, joint details, valve schedules, electrical schematics, and instrumentation layouts. For multi-village schemes covering extensive geographical areas, the documentation complexity increases significantly, requiring comprehensive coordination between multiple implementation agencies and adherence to standardized drawing conventions.

Rural Piped Water Supply Schemes (RPWSS) under the digital transformation initiative require comprehensive geo-tagged asset mapping that integrates with the PM Gati Shakti platform for national infrastructure coordination. This digital documentation approach ensures that every component of the water supply infrastructure - from source intake to household connections is accurately recorded with spatial coordinates, source water quality at the time of inception technical specifications, operational parameters, and ownership details.

The RPWSS module facilitates the creation of unique scheme identifiers that enable real-time monitoring, predictive maintenance, and data-driven decision making.

Thorough documentation during commissioning significantly reduces post-commissioning failures, operational disruptions, and maintenance costs. International best practices emphasize the importance of digital asset registries that link physical infrastructure with operational data, financial information, and performance metrics. This comprehensive documentation approach enables evidence-based decision making, facilitates knowledge transfer, and supports continuous improvement of rural water supply systems. The guidelines emphasize that accurate As-built documentation is essential for economic viability assessment, benefit-cost ratio calculations, and post-implementation impact evaluation. This documentation serves as the baseline reference for measuring scheme performance against projected outcomes and identifying areas for operational optimization.

7.1.2 Verification of Component Installation as per Design Specifications:

The verification process requires systematic inspection of all infrastructure components to ensure compliance with design specifications, technical standards, and quality requirements. This comprehensive assessment encompasses pipelines, pumps, valves, storage tanks, treatment plants, meters, electrical installations, instrumentation, and control systems. The verification protocol must document material compliance, installation quality, functional readiness, and adherence to safety standards throughout the water supply system.

JJM Operational Guidelines specify that all components should meet BIS specifications and be installed according to manufacturer requirements and approved construction standards. The guidelines emphasize the importance of third-party verification to prevent quality compromises that could affect long-term system performance. For schemes incorporating advanced technologies such as solar power systems, SCADA automation, or specialized treatment processes, additional verification protocols address technology-specific requirements and integration challenges.

For rural piped water supply schemes operating in water quality-affected areas, the As-built drawing must comprehensively document critical information to ensure effective monitoring and management. This includes the source water quality at the time of the scheme's inception, providing a baseline for water safety assessments. Detailed records of the specific water treatment processes employed must be included, along with the date of inception and operational timelines for these systems. The drawing should also clearly state who is responsible for operation and maintenance—whether managed by the manufacturer or a designated third party. Additionally, the quality and quantity of water supplied to rural households must be continuously monitored and recorded to ensure that the water meets safety and quantity standards.

CPHEEO technical standards provide detailed specifications for component installation, including pipe laying procedures, joint specifications, valve installation requirements, pump positioning, electrical connections, and safety measures. The manual emphasizes that proper installation techniques directly impact system performance, operational reliability, and maintenance requirements. Component verification with respect to implemented DPR must address both individual element functionality and integrated system performance to ensure optimal operational outcomes.

Multi-village schemes covering diverse geographical conditions and serving multiple communities present additional verification complexity, requiring coordination between various implementing agencies, contractors, and local stakeholders. The verification process must address hydraulic balancing between villages, pressure management across elevation variations, and equitable service delivery to all beneficiary communities. Experience from projects like the Gandhi Sagar Multi-Village Water Supply Scheme highlights the importance of comprehensive component verification in ensuring system-wide performance.

International best practices recommend staged verification protocols that address foundation works, structural installations, mechanical systems, electrical installations, and integrated system functionality. This systematic approach enables early identification of deficiencies and timely corrective action before system commissioning.

7.1.3 Check for Visible Defects, Leaks, Incomplete Installations, or Signs of Damage:

Visual inspection for defects, leaks, incomplete installations, or signs of damage forms a critical pre-commissioning activity that helps identify potential failure points before system activation. This systematic assessment prevents costly repairs, service disruptions, and community dissatisfaction during the operational period. The inspection protocol must be comprehensive, systematic, and well-documented to ensure that all potential issues are identified and addressed.

The defect identification process should encompass both visible surface defects and potential subsurface issues that could affect system performance. For rural water supply schemes serving remote and geographically challenging areas, defect identification requires specialized expertise, appropriate equipment, and systematic inspection procedures to assess underground pipelines, pumping stations, treatment facilities, and distribution networks. Documentation of identified defects, along with remedial action plans and implementation timelines, forms an integral part of the commissioning record.

CPHEEO guidelines specify detailed inspection checklists for different infrastructure components, including pipeline integrity, joint soundness, valve operation, pump alignment, electrical connections, instrumentation functionality, and safety system readiness. The inspection protocol must be systematic, comprehensive, and properly documented to ensure that no critical defects are overlooked before system commissioning.

The importance of independent defect assessment by qualified technical personnel who are not directly involved in construction activities can be appreciated. This independent verification approach enhances objectivity, improves quality assurance, and provides additional confidence in system readiness for operational use.

7.2. System Testing Phase: Technical Validation and Performance Verification

7.2.1 Hydrostatic Pressure Testing- Pipeline Testing Under Pressure:

Hydrostatic pressure testing represents the most critical technical validation of pipeline integrity and system capacity to operate safely under design pressure conditions. This comprehensive testing protocol involves pressurizing the pipeline system to verify leak-free operation, structural integrity, and capacity to withstand operational pressures throughout the distribution network. The testing must be conducted systematically, comprehensively documented, and meet established international standards for pressure testing.

Hydrostatic pressure testing for pipe and joints leakage- test pressure at the lowest point of the test section shall be not less than the limit specified in a) or b), whichever is greater.

a) For PW ≤ 10 bar: PST = 1.5 x times PW

b) For PW > 10 bar: PST = PW + 5

c) The maximum PW: PST = PMDc Where,

PW: highest pressure that occurs at a time and a point in the pipeline when operating continuously under stable conditions, without surge;

PST: pressure to which a pipeline or a pipeline section is subjected for testing purposes;

PMDc: maximum operating pressure of the system or of the pressure zone fixed by the designer considering future developments including surge in case of surge is calculated (pumping and water mains) to ensure structural integrity and operational reliability.

The testing protocol must cover all pipeline sections systematically, with particular attention to joint connections, valve assemblies, thrust restraint systems, and critical infrastructure components. Testing procedures should follow established protocols that specify test duration, acceptable pressure drop limits, test equipment requirements, and remedial action procedures for sections that fail to meet acceptance criteria.

Rural piped water supply systems face unique challenges due to varied topography, soil conditions, geological factors, and installation environments. The hydrostatic testing protocol must account for these factors, with pressure test parameters adjusted for elevation changes, system configuration, and local conditions. Testing procedures should address sectional testing approaches for large multi-village schemes, enabling systematic validation without compromising overall project timelines or operational readiness.

The testing methodology requires specialized equipment including calibrated pressure gauges, test pumps, monitoring systems, and safety equipment. For large multi-village schemes covering extensive geographical areas, sectional testing approaches enable systematic validation while maintaining project schedule requirements and ensuring comprehensive system verification. Documentation of test results, including pressure readings, test duration, temperature conditions, identified defects, and corrective actions, provides essential records for operational management, warranty compliance, and future maintenance planning.

CPHEEO technical guidelines specify detailed procedures for hydrostatic pressure testing, including test setup requirements, pressure application procedures, acceptance criteria, documentation standards, and safety protocols. The guidelines emphasize that proper pressure testing is essential for long-term system reliability and prevention of operational failures that could disrupt service delivery to rural communities. Hydrotesting should invariably be conducted for all pipes whether gravity based or pumped water supply scheme.

7.2.2 Check for Leakages in Tap Connection Points:

Systematic inspection of tap connection points for leakages ensures the integrity of the final service delivery infrastructure and prevents water losses that could compromise system performance, water quality and community satisfaction. This inspection protocol addresses household service connections, community taps, institutional connections, and all terminal points where water is delivered to end users. The verification process must be comprehensive, systematic, and properly documented to ensure reliable service delivery.

Tap connection leakage assessment requires systematic inspection of all connection points, including service line connections, meter installations, valve assemblies, faucet installations, and associated fittings. The inspection protocol should address both visible leakages and potential seepage issues that could develop over time and affect system performance. Proper joint installation, appropriate materials selection, and quality workmanship are critical factors in preventing connection point failures.

JJM service delivery standards require that all household tap connections provide reliable, adequate water supply without significant losses or operational problems. The program's focus on Functionality of Household Tap Connections emphasizes the importance of terminal connection reliability in achieving sustainable service delivery outcomes. Connection point integrity directly impacts community acceptance, water system efficiency, and long-term sustainability of rural water supply services.

Multi-village schemes with numerous connection points require systematic inspection procedures that address connection standardization, installation quality, material compliance, and long-term reliability. The inspection process must verify that all connections meet technical standards, provide adequate flow rates, maintain system pressure and water quality throughout the distribution network. Documentation of connection point inspection results provides essential information for operational management and maintenance planning.

Connection point failures represent a significant cause of system performance problems and community dissatisfaction. International best practices recommend systematic connection point inspection, standardized installation procedures, and quality assurance protocols to prevent operational problems and ensure sustainable service delivery.

7.2.3 Flushing & Disinfection of all Water Reservoirs & Pipelines

Comprehensive flushing and disinfection of all water storage and distribution infrastructure ensures microbiological safety and removes construction debris, sediments, and potential contaminants from the system. This critical protocol prepares the infrastructure for safe water delivery and establishes baseline conditions for ongoing water quality management. The procedure must be systematic, thorough, and properly documented to ensure effective system preparation and regulatory compliance.

Flushing procedures involve systematic water circulation through all pipeline sections, storage facilities, and distribution networks to remove construction materials, sediments, foreign objects, and potential contaminants that could affect water quality or system performance. The flushing protocol should follow established procedures that specify flow rates, duration, monitoring requirements, and acceptance criteria for system readiness. Water used for flushing must meet potable water standards to prevent introduction of additional contaminants during the cleaning process.

Disinfection procedures involve systematic application of chlorine or other approved disinfectants throughout the water storage and distribution system to eliminate pathogenic microorganisms and establish residual disinfection capacity. The disinfection protocol must address contact time requirements, disinfectant concentration, system circulation, and verification testing to ensure effective pathogen inactivation. Residual chlorine levels should be verified throughout the system to confirm adequate disinfection and establish baseline conditions for ongoing monitoring.

BIS 10500:2012 standards specify requirements for water quality including microbiological parameters that must be achieved through effective disinfection procedures. The standards emphasize that systematic disinfection is essential for preventing waterborne diseases and ensuring safe drinking water delivery to rural communities. Water quality testing following disinfection procedures provides verification of system readiness and regulatory compliance.

World Health Organization guidelines recommend systematic disinfection procedures for water supply systems and specify contact time requirements, disinfectant dosages, and verification testing protocols. The guidelines emphasize that effective disinfection requires proper system design, adequate disinfectant contact time, and ongoing monitoring to maintain water safety throughout the distribution system.

7.2.4 Flow and Capacity Testing- Verify Delivery at all Points Including Tail-End:

Comprehensive flow and capacity testing validates system hydraulic performance against design parameters and service delivery commitments throughout the distribution network. This critical assessment verifies that the system delivers designed flow rates and adequate water pressure at all delivery points, particularly at tail-end households where hydraulic conditions are most challenging. The testing protocol must address system capacity under various demand scenarios and demonstrate reliable service delivery capability.

JJM service standards require 55 litres per capita per day (LPCD) water supply as the minimum capacity requirement for rural water supply schemes. Flow testing must demonstrate that the system can deliver this quantity consistently under normal operational conditions and accommodate peak demand scenarios without service degradation. Pressure testing verifies adequate residual pressure for reliable household-level water supply, typically requiring minimum 7 meters head for residential buildings.

Multi-village schemes present additional hydraulic complexity due to varying elevation profiles and diverse demand patterns across served communities. Flow testing protocols must address hydraulic balancing between villages, pressure management across elevation changes, and equitable capacity allocation for each served area. The testing must verify that all villages receive adequate service levels regardless of their position in the distribution network or elevation profile.

CPHEEO hydraulic design guidelines specify flow testing procedures including test point selection, measurement methods, documentation requirements, and acceptance criteria. The guidelines emphasize that comprehensive flow testing is essential for verifying design assumptions and ensuring that theoretical calculations translate into actual performance. Flow testing results provide critical data for operational optimization, maintenance planning, and system performance monitoring.

Integration with SCADA systems enables real-time flow monitoring and automated control adjustments to optimize system performance and maintain service reliability. Modern rural water supply schemes increasingly incorporate automated monitoring and control capabilities that enhance operational efficiency and reduce manual intervention requirements. Real-time data collection during flow testing establishes baseline performance metrics and operational parameters for ongoing system management.

7.2.5 Water Quality Testing- Chemical, Biological, Physical Tests

Comprehensive water quality testing forms a fundamental component of the commissioning protocol, ensuring that supplied water meets BIS 10500:2012 standards and its subsequent amendments for potable water and regulatory requirements throughout the distribution system. The testing protocol encompasses physical, chemical, and bacteriological parameters measured at multiple points from treatment plant outlet to household tap connections. This systematic approach ensures water safety, regulatory compliance, and community acceptance of piped water supply services.

Chemical parameters testing includes pH, turbidity, total dissolved solids, fluoride, arsenic, iron, nitrate, and other contaminants (region specific) that affect water potability, taste, and consumer acceptance. The testing protocol must address source water characteristics, treatment process effectiveness, and distribution system impacts on water quality. Specialized testing may be required for region-specific contaminants such as heavy metals, pesticides, or industrial pollutants that could affect water safety.

Bacteriological testing focuses on indicator organisms such as E-coli and total coli form bacteria that signal potential health risks from waterborne pathogens. The testing protocol requires proper sample collection, preservation, transport, and analysis procedures to ensure accurate results and reliable assessment of microbiological safety. Testing must be conducted by ISO/IEC 17025 compliant accredited laboratories to ensure credible results and regulatory compliance.

Physical parameters including colour, odour, taste, and appearance significantly influence community acceptance and sustained usage of piped water supply systems. These organoleptic properties directly impact consumer perception, system utilization rates, and community satisfaction with water supply services. Testing protocols must address sensory evaluation alongside technical measurements to ensure comprehensive water quality assessment.

JJM Water Quality Management Information System (WQMIS) enables real-time reporting and trend analysis for proactive water quality management. The system facilitates centralized monitoring, automated alerts, and data-driven decision making for water quality management across rural water supply schemes. Integration with IoT-based monitoring systems enables continuous water quality surveillance and rapid response to quality deviations.

7.2.6 Check RCL at Tail End Households- Ensure 0.2 ppm Minimum

Residual chlorine level (RCL) testing ensures effective disinfection while maintaining water palatability for community acceptance. The protocol requires verification of chlorine levels at tail-end households with target concentration of 0.2 ppm minimum to ensure adequate protection against microbial contamination throughout the distribution network. This testing validates disinfection system effectiveness and provides assurance of microbiological safety at the point of consumption.

World Health Organization guidelines recommend residual chlorine levels between 0.2-0.5 mg/l for domestic water supply, with higher levels near disinfection points and minimum levels at distribution extremities. Testing protocols must account for chlorine demand variations due to water quality, temperature, residence time, and distribution system characteristics. Field testing using DPD (diethyl paraphenylene diamine) colorimetric methods provides rapid results for operational decision-making and system optimization.

Commissioning phase RCL testing establishes baseline chlorination requirements and optimal dosing strategies for different operational conditions. The testing must verify that disinfection systems can maintain required chlorine levels under peak demand conditions while avoiding excessive chlorination that affects taste and community acceptance. Spatial and temporal variations in RCL levels provide critical information for operational protocol development and dosing system adjustment.

Community acceptance of residual chlorine represents a critical factor in the success of rural water supply schemes. Educational programs addressing chlorine taste, odour, and safety benefits are essential for building community confidence in piped water supply systems. IEC initiatives must address local cultural preferences and communication methods effective for rural communities. The threshold of odour is generally 0.7 ppm.

Automated chlorination systems with real-time monitoring capabilities enable precise dosing control and consistent RCL maintenance throughout the distribution system. Integration with SCADA systems provides centralized monitoring and automated adjustment of chlorination rates based on demand variations and water quality conditions. Modern rural water supply schemes increasingly incorporate automated disinfection systems that enhance water safety while reducing operational complexity.

7.2.7 Electrical and Mechanical Testing- Pumps, Motors, Valves, Sensors, Controls

Comprehensive electrical and mechanical testing ensures proper functioning of pumps, motors, valves, sensors, and control systems throughout the water supply infrastructure. This systematic testing protocol encompasses individual component validation, integrated system operation, and safety system verification. The testing must verify operational reliability, performance parameters, and safety compliance for all electromechanical equipment.

Pumping system testing includes performance verification under various operational conditions to validate capacity, efficiency, and reliability parameters. Motor testing encompasses insulation resistance measurement, winding continuity verification, thermal protection validation, and operational performance assessment. The testing protocol must address motor starter configurations, overload protection settings, phase sequence correctness, and electrical safety measures.

Control system testing verifies proper operation of automatic start/stop functions, level controls, pressure switches, alarm systems, and safety interlocks. The testing must demonstrate reliable system response to various operational scenarios including normal operation, emergency conditions, and fault situations. Integration testing ensures coordination between local control systems and central monitoring facilities.

For schemes incorporating renewable energy systems, particularly solar-powered installations, specialized testing protocols address photovoltaic system performance, battery backup capacity, hybrid operation modes, and power management systems. The testing must verify system resilience under varying power conditions and validate automatic switching between different power sources. Energy efficiency testing provides baseline data for operational optimization and performance monitoring.

CPHEEO technical standards specify detailed testing procedures for electrical and mechanical systems, including equipment specifications, installation requirements, testing protocols, and acceptance criteria. The standards emphasize that proper electromechanical system performance is critical for reliable water supply operation and long-term system sustainability.

7.2.8 Automation Check- SCADA or Automation Systems Testing

Automation system testing validates SCADA functionality and remote monitoring capabilities where applicable in modern rural water supply schemes. Contemporary rural water supply systems increasingly incorporate automated control systems for improved efficiency, reduced operational costs, and enhanced service reliability. SCADA commissioning involves testing communication links, data acquisition systems, remote control functions, alarm management, and cyber security measures.

SCADA testing protocol includes verification of sensor accuracy, data transmission reliability, control response times, and alarm functionality. Human-Machine Interface (HMI) testing ensures proper visualization of system status and operator control capabilities for effective system management. Integration testing verifies coordination between local control systems and central monitoring stations for comprehensive system oversight.

Communication system testing addresses network connectivity, data transmission rates, system redundancy, and failure recovery procedures. The testing must verify reliable communication under various operational conditions including power outages, communication failures, and equipment malfunctions. Automated backup systems and failsafe operations must be validated to ensure continuous system operation.

Cyber security testing becomes increasingly important as rural water systems adopt digital technologies and connect to broader communication networks. The commissioning protocol must address network security, access control, data protection measures, and intrusion prevention systems to prevent unauthorized system access and ensure operational continuity. Regular security assessments and system updates are essential for maintaining cyber security throughout the operational period.

IoT integration enables advanced monitoring capabilities including real-time water quality measurement, flow monitoring, pressure surveillance, and predictive maintenance applications. Testing protocols must validate IoT sensor accuracy, communication reliability, and data integration with broader monitoring systems. Modern rural water supply schemes benefit from comprehensive automation systems that enhance operational efficiency and service reliability.

7.2.9 Equipment Calibration- Meters, Gauges, and Sensors Calibration

Systematic calibration of meters, gauges, and sensors ensures accurate measurement and monitoring throughout the water supply system. This comprehensive process involves verification against certified reference standards and adjustment of instrument readings to achieve specified accuracy levels. Flow meters, pressure transmitters, level indicators, water quality analyzers, and control system sensors require individual calibration protocols specific to their measurement principles and operational ranges.

Calibration procedures must follow established standards and use certified reference equipment to ensure measurement accuracy and reliability. The calibration process should address zero adjustment, span calibration, linearity verification, and repeatability assessment for each instrument type. Documentation of calibration results, including before and after readings, adjustment procedures, and calibration certificates, provides essential reference information for ongoing maintenance and quality assurance.

Flow meter calibration requires specialized facilities or portable calibration equipment capable of generating known flow rates for comparison with instrument readings. Pressure gauge calibration uses dead weight testers or calibrated pressure standards to verify accuracy across the operating range. Water quality sensor calibration involves certified reference solutions and standardized procedures specific to each parameter.

Calibration intervals must be established based on manufacturer recommendations, usage conditions, and accuracy requirements. Critical instruments affecting water quality, system control, or billing accuracy may require more frequent calibration than general monitoring instruments. Calibration scheduling and tracking systems ensure that all instruments maintain acceptable accuracy throughout their operational life.

Integration with SCADA systems enables automated calibration tracking and alerts for upcoming calibration requirements. Digital calibration records facilitate maintenance planning and provide historical data for instrument performance assessment. Modern instrumentation increasingly incorporates self-diagnostic capabilities that enhance calibration effectiveness and reduce maintenance requirements.

7.2.10 Control System Adjustment- Operating Parameters Setting:

Control system adjustment involves setting operational parameters such as pump timing sequences, flow rate controls, treatment process variables, and alarm thresholds according to design requirements. The adjustment process requires coordination between hydraulic performance objectives, water quality requirements, energy efficiency considerations, and operational simplicity. Optimal control settings minimize energy consumption while maintaining required service levels throughout the distribution network.

Pump control system adjustment includes start/stop pressure settings, flow rate controls, sequencing parameters, and protection settings. The adjustment process must consider system demand patterns, pressure requirements, pump characteristics, and energy optimization. Automated pump control systems can significantly improve operational efficiency while reducing manual intervention requirements.

Treatment process control adjustment involves setting chemical dosing rates, contact time parameters, backwash cycles, and quality monitoring thresholds. The adjustment process must ensure consistent treatment effectiveness while minimizing chemical consumption and operational complexity. Automated treatment systems can maintain consistent water quality while reducing operator skill requirements.

Alarm and safety system adjustment includes setting threshold values for critical parameters such as pressure limits, flow rates, water quality deviations, and equipment status indicators. The adjustment process must balance operational flexibility with safety requirements and ensure appropriate response to abnormal conditions. Graduated alarm systems provide operators with clear guidance for appropriate responses to various operational scenarios.

Documentation of control system settings provides essential reference information for operational management, troubleshooting, and system optimization. Control system documentation should include parameter settings, adjustment procedures, operational sequences, and emergency procedures. Regular review and optimization of control settings based on operational experience can improve system performance and efficiency.

7.3. Trial Run Phase: Operational Validation and Community Integration

7.3.1 Operate System for Trial Period:

The trial run phase involves operating the complete water supply system for 7-14 days (or more) to validate stability, efficiency, and consistency in water delivery under actual operational conditions. This extended operational period enables identification of performance issues that may not appear during short-term testing phases and provides critical data on system behavior under realistic demand patterns. The trial run serves as final validation of system capacity to meet design commitments and community service level expectations.

Continuous operation during the trial period requires coordination of all system components including source pumping, treatment processes, storage management, distribution control, and household service delivery. The operational protocol must address demand variation management, system optimization, emergency response procedures, and performance monitoring. Round the clock operational coverage may be required to ensure continuous system monitoring and rapid response to operational issues during this phase.

Performance monitoring during the trial period tracks key performance indicators including flow rates, pressure levels, water quality parameters, energy consumption, system reliability metrics, and service delivery consistency. Data collection systems must capture both normal operational data and anomalous events that could indicate potential system problems or optimization opportunities. This comprehensive monitoring approach enables early identification of operational issues and preventive maintenance requirements.

Community feedback during the trial run provides critical information about service quality, water acceptability, system reliability, and user satisfaction. Structured feedback collection through household surveys, community meetings, and stakeholder consultations ensures that community perspectives are incorporated into system commissioning and operational planning. Community acceptance is essential for long-term system sustainability and justifies the substantial public investment in rural water infrastructure.

Trial run documentation provides baseline operational data against which future system performance can be evaluated and optimized. Performance data collected during this period establishes operational benchmarks for ongoing monitoring, maintenance planning, and system improvement initiatives. Systematic documentation of operational experience informs training programs for operational staff and community management committees.

7.3.2 Monitor System Stability, Efficiency, and Consistency:

Comprehensive monitoring of system stability, efficiency, and consistency during the trial run provides critical validation of operational readiness and long-term viability. System stability assessment addresses pressure maintenance, flow consistency, treatment process reliability, and control system performance under varying operational conditions. Efficiency monitoring evaluates energy consumption, chemical usage, maintenance requirements, and overall operational costs relative to design parameters and service delivery objectives.

Stability monitoring includes hydraulic performance assessment across different demand scenarios, seasonal variations, and operational modes. The monitoring protocol should address pressure fluctuations, flow variations, pump cycling patterns, and storage management effectiveness throughout the distribution network. Control system stability ensures consistent automated operation and appropriate response to changing operational conditions.

Efficiency assessment encompasses energy consumption analysis, chemical utilization rates, maintenance requirements, and operational cost evaluation relative to service delivery outcomes. Energy efficiency monitoring is particularly critical for solar-powered systems where performance optimization directly impacts operational sustainability. Treatment efficiency monitoring ensures consistent water quality while minimizing chemical consumption and operational complexity.

Consistency monitoring addresses service delivery reliability, water quality maintenance, pressure adequacy, and system availability throughout the trial period. Service consistency is critical for community acceptance and demonstrates the system's ability to meet ongoing service commitments. Monitoring data provides evidence of system readiness for handover to community management and long-term operation.

Performance benchmarking against design parameters and regulatory standards provides objective assessment of system commissioning success. Comparison with similar systems and industry standards enables identification of best practices and areas for improvement. Systematic monitoring data supports evidence-based operational decisions and continuous system improvement initiatives.

7.3.3 Issue Identification- Address Pressure Drops, Pump Failures, Quality Deviations

Systematic issue identification during the trial run addresses operational problems such as pressure drops, pump failures, water quality deviations, control system malfunctions, and service delivery interruptions. Early problem identification enables corrective action without long-term service disruption to beneficiary communities and prevents minor issues from developing into major operational failures. The protocol requires detailed documentation of all identified issues, root cause analysis, implemented corrective measures, and preventive action recommendations.

Pressure drops investigation addresses hydraulic system performance, pipeline integrity, valve operation, and pump system effectiveness. Common causes include pipeline blockages, valve malfunctions, pump performance degradation, and distribution system imbalances. Systematic pressure monitoring throughout the distribution network enables identification of specific problem areas and targeted corrective action.

Pump failure analysis addresses mechanical, electrical, and control system issues that could affect system reliability and service delivery. Common problems include motor overload conditions, bearing wear, impeller damage, electrical connection failures, and control system malfunctions. Preventive maintenance protocols based on trial run experience can significantly reduce operational failures and service interruptions.

Water quality deviation investigation addresses treatment process effectiveness, disinfection system performance, distribution system integrity, and source water changes. Systematic water quality monitoring enables rapid identification of quality problems and implementation of corrective measures. Quality deviation response protocols ensure rapid restoration of safe water supply and prevention of health risks.

Issue tracking systems enable continuous improvement of operational protocols and maintenance procedures based on field experience. Documentation of problem resolution procedures informs training programs for operational staff and community management committees. Systematic analysis of operational issues supports development of improved design standards and construction practices for future schemes.

7.3.4 Joint Inspection- Transect Walk with Stakeholders:

Joint inspection involving engineers, contractors, Village Panchayat/VWSC representatives, and community members ensures stakeholder consensus on system readiness for operational handover. This collaborative validation process builds community confidence in the water supply system and facilitates smooth transition to local management. Transect walks through the service area enable visual verification of infrastructure completion, household connection functionality, and overall system readiness.

Stakeholder participation in the inspection process enhances transparency and accountability in project implementation while building community ownership. Community representatives can identify any remaining deficiencies and ensure that local concerns are addressed before final commissioning. This participatory approach strengthens community commitment to long term system sustainability and effective local management.

Joint inspection protocols should include systematic assessment of all infrastructure components, service delivery points, water quality conditions, and operational readiness. Inspection checklists ensure comprehensive evaluation and consistent documentation of system condition. Stakeholder sign-off procedures provide formal acceptance and clear transfer of responsibility for ongoing operation and maintenance.

Documentation of joint inspection findings provides formal record of stakeholder acceptance and any outstanding items requiring completion. Signed inspection reports establish clear responsibility for ongoing operation, maintenance, and system management activities. Community participation in formal acceptance procedures enhances local ownership and commitment to system sustainability.

Training and capacity building during the inspection process prepares community representatives for effective system management and oversight responsibilities. Joint inspection provides opportunities for knowledge transfer, skill development, and relationship building between technical agencies and community management committees.

7.3.5 IEC Initiatives- Community Awareness and Residual Chlorine Acceptance:

Information, Education, and Communication (IEC) initiatives enhance community awareness and ensure acceptance of residual chlorine as an essential measure for maintaining safe drinking water quality. Community education programs address concerns about chlorine taste, odour, and perceived safety while emphasizing the health benefits of disinfected water supply. Effective IEC campaigns significantly improve community acceptance and sustained usage of piped water supply systems.

Educational content must address local cultural preferences, language requirements, and communication channels effective for rural communities. Training programs for community water management committees build local capacity for basic operation, maintenance, and water quality monitoring activities. Women's participation in IEC programs enhances household-level acceptance and proper utilization of water supply facilities.

Health education components address waterborne disease prevention, safe water handling practices, and the protective role of residual chlorine in maintaining water safety. Community understanding of disinfection benefits supports acceptance of chlorinated water and reduces resistance to piped water supply systems. Demonstration of water quality testing procedures builds community confidence in water safety and system management.

IEC program evaluation assesses effectiveness in changing community behaviour, improving system utilization rates, and building local management capacity. Feedback from community members identifies additional educational needs and informs ongoing communication strategies. Systematic documentation of IEC activities supports replication of successful approaches in other schemes and locations.

Integration with broader health and development programs enhances IEC effectiveness and provides sustainable platforms for ongoing community education. Coordination with ASHA workers, school programs, and self-help groups extends IEC reach and reinforces key messages about water safety and system management.

7.4. Documentation and Compliance Phase: Ensuring Institutional Accountability

7.4.1 Commissioning Report- Detailed Summary of all Tests and Results:

The commissioning report provides comprehensive documentation of all testing procedures, results, observations, and recommendations during the commissioning process. This detailed report serves as the official record of system readiness for operational use and demonstrates compliance with technical specifications, regulatory requirements, and performance standards. The report format must include executive summary, testing protocols, results analysis, identified issues, corrective actions, and operational recommendations for effective system management.

Technical appendices should contain detailed test data, calibration certificates, water quality analysis reports, equipment specifications, and photographic documentation of completed infrastructure. As-built drawings, warranty information, and operational manuals form integral components of the commissioning documentation package. Digital documentation using the RPWSS module enables real-time access to commissioning records for operational planning, maintenance scheduling, and performance monitoring.

The commissioning report serves as baseline reference for performance monitoring, warranty claims, system evaluation activities, and future upgrade planning. Quality of commissioning documentation directly impacts long-term operational efficiency, maintenance effectiveness and system sustainability. Comprehensive documentation supports evidence-based decision making and enables continuous improvement of rural water supply systems.

7.4.2 Operation Manuals- User Manuals, Troubleshooting Guides, Maintenance Schedules:

Comprehensive operation manuals, troubleshooting guides, and maintenance schedules ensure effective knowledge transfer to operational staff and community management committees. These manuals must be tailored to local capacity levels and available in appropriate local languages for effective utilization. User-friendly formats with visual aids, step-by-step procedures, and practical examples enhance usability for operators with varying technical backgrounds and educational levels.

Maintenance schedules specify routine inspection requirements, component replacement intervals, preventive maintenance activities, and seasonal operational adjustments needed to sustain system performance. Troubleshooting guides address common operational problems and provide systematic approaches for problem diagnosis, resolution procedures, and when to seek technical assistance. Emergency response procedures ensure rapid action for critical system failures affecting water supply continuity.

Operation manuals should address daily operational procedures, system monitoring requirements, water quality management, energy optimization, and record keeping for effective system management. Community-level manuals focus on basic operational tasks, routine maintenance activities, and problem identification that can be managed locally. Technical manuals provide detailed procedures for complex maintenance, repairs, and system optimization activities.

Training programs based on operation manuals build local capacity for effective system management and reduce dependence on external technical support. Regular updating of manuals reflects operational experience and incorporates improvements in maintenance procedures, troubleshooting techniques, and operational optimization. Digital versions of operational manuals enable easy updating, distribution, and access from mobile devices.

Integration with CPHEEO standards and JJM operational guidelines ensures consistency with national technical standards and program requirements. Operation manuals should reference relevant technical standards, regulatory requirements, and best practices for comprehensive system management.

7.4.3 Compliance Certificates- Water Quality, Pressure Test Reports, Statutory Documents:

Compliance certificates including water quality certificates, pressure test reports, electrical safety certificates, and other statutory documents provide formal verification of regulatory compliance and system readiness. These certificates demonstrate adherence to BIS 10500 water quality standards, CPHEEO technical guidelines, electrical safety requirements, and local regulatory frameworks. Regulatory compliance certification enables official system commissioning and authorization for public water supply service delivery.

Accredited laboratory certifications validate water quality testing results and provide credible assurance of safe drinking water supply. Structural integrity certificates confirm compliance with engineering design standards, construction quality requirements, and safety protocols. Environmental compliance certificates address ecological protection, waste management, and sustainability requirements where applicable.

Electrical safety certificates verify compliance with electrical codes, safety standards, grounding requirements, and operational safety measures. Pressure testing certificates document pipeline integrity, system capacity, and structural soundness under operational conditions. Equipment certification verifies that all installed components meet technical specifications, performance standards, and quality requirements.

Compliance documentation facilitates insurance coverage, warranty claims, regulatory monitoring, and operational licensing throughout the system lifecycle. Regular compliance verification ensures continued adherence to regulatory standards and identifies any corrective action requirements. Systematic compliance tracking supports proactive management of regulatory requirements and prevents operational disruptions.

Integration with digital documentation systems enables efficient compliance tracking and automated alerts for renewal requirements. RPWSS digital infrastructure facilitates compliance monitoring and provides centralized access to certification records for regulatory authorities and operational managers.

7.4.4 Integration with Rural Water Supply Infrastructure Framework

1. In-Village and Out-Village Infrastructure Concepts

The commissioning protocol must address the fundamental distinction between in-village and out-village infrastructure components that defines rural water supply system architecture. Out-village infrastructure encompasses water transfer from treatment plants to master balancing reservoirs and from storage facilities to village-level distribution points. In-village infrastructure includes distribution networks, household connections, and service delivery systems within village boundaries. The concept of serviced area and the infra located outside the service area providing the external water support must be clearly established and explained to the rural community.

Single Village Schemes (SVS) typically rely on local groundwater or surface water sources managed directly by Village Panchayats or Village Water and Sanitation Committees. Multi-Village Schemes (MVS) connect multiple communities to regional water sources through bulk water transfer systems and shared treatment facilities. Regional water supply schemes serve broader geographical areas and may include both rural and urban service areas through integrated infrastructure networks. Bulk water transfer schemes provide raw or treated water to areas without adequate local sources through long-distance transmission systems. These schemes require specialized commissioning procedures that address large scale infrastructure, complex hydraulics, institutional coordination, and service allocation between multiple beneficiary communities. Commissioning protocols must ensure equitable service delivery across all participating communities while maintaining system efficiency and sustainability.

2. RPWSS Digital Infrastructure Integration

The Rural Piped Water Supply Schemes (RPWSS) module represents a foundational Digital Public Infrastructure for asset management, performance monitoring, and service delivery optimization.

This comprehensive digital registry assigns unique identifiers to integrated water supply systems including all geo-tagged components from source to household connections. RPWSS integration enables real-time monitoring, predictive analytics, and automated functionality assessment that enhances commissioning effectiveness and operational management.

Asset mapping through RPWSS includes detailed documentation of sources, treatment facilities, transmission infrastructure, distribution networks, storage systems, and service connections. Integration with PM Gati Shakti platform enables comprehensive infrastructure coordination and supports convergence with other development programs. Digital asset registry facilitates maintenance scheduling, performance tracking, and investment planning throughout the system lifecycle.

RPWSS commissioning integration enables automated documentation, performance benchmarking, and compliance tracking that reduces manual effort and improves accuracy. Real-time data integration supports evidence-based commissioning decisions and enables rapid identification of performance issues. Digital infrastructure foundation supports development of advanced applications including citizen feedback platforms, mobile inspection tools, and predictive maintenance systems.

7.4.5 Recommendations for Enhanced Implementation

1)Institutional Capacity Building:

Enhanced training programs for commissioning teams should address both technical competencies and community engagement skills required for effective rural water supply system validation.

Certification programs for commissioning professionals could establish standardized competency requirements and improve service quality across different implementing agencies and geographical regions.

Community capacity building programs should strengthen local institutions for effective participation in commissioning activities and long-term system management. Women's leadership development in water management committees enhances system sustainability and community ownership while addressing gender equity objectives.

2) Technology Integration and Innovation:

Adoption of advanced monitoring technologies including IoT sensors, automated data collection systems, and mobile inspection platforms can enhance commissioning efficiency, accuracy, and documentation quality. Integration with national digital infrastructure enables real-time reporting, centralized performance monitoring, and data-driven policy development.

Innovation in commissioning methodologies specifically adapted to rural infrastructure conditions could reduce time requirements, costs, and technical complexity while maintaining quality standards. Development of standardized commissioning protocols for different scheme types and geographical conditions would facilitate consistent implementation across states and regions.

3) Quality Assurance and Continuous Improvement:

Independent third-party verification of commissioning activities provides objective validation of system readiness and compliance with technical standards.

Regular review and updating of commissioning protocols based on field experience, technological advances, and evolving regulatory requirements ensures continued effectiveness.

Performance benchmarking across different scheme types, geographical regions, and implementation approaches enables identification of best practices and systematic improvement opportunities.

Documentation of lessons learned supports knowledge sharing, capacity building, and continuous improvement across the rural water supply sector.

8. Conclusion

The comprehensive commissioning protocol framework presented here establishes a systematic approach to validating rural piped water supply infrastructure that honors both technical excellence and community development objectives. Successful commissioning requires integration of technical expertise, regulatory compliance, community participation, and institutional capacity to ensure that substantial public investments translate into reliable service delivery for rural communities. The evolving landscape of rural water supply, characterized by increasing system complexity, technological integration, and community empowerment, necessitates continuous refinement of commissioning approaches while maintaining focus on service quality and sustainability. Future developments should emphasize standardization of procedures while preserving flexibility to address local conditions, community preferences, and emerging challenges. Investment in comprehensive commissioning protocols, supported by appropriate institutional frameworks, community engagement strategies, and digital infrastructure, represents the foundation for achieving universal rural water supply coverage while ensuring long-term sustainability and service excellence. The framework presented provides a roadmap for systematic implementation that balances technical rigor with practical feasibility, honoring both engineering excellence and community development aspirations that define India's transformation toward universal rural water supply access.

Checklist for Commissioning of Rural Water Supply Scheme

Sl. No.	***Activity/Item***	***Details/Verification Points***	***Status (✓ / X / Remarks)***
A. Documentation and Pre-Commissioning Preparations			
1	As built-Drawings	Verified availability and accuracy of As-built drawings for all components (intake, pumping stations, pipelines, storage tanks, treatment units, distribution network, electrical layouts).	
2	Design Compliance Inspection	All infrastructure components inspected for conformity with design specifications, technical standards, and quality norms as approved by competent authority.	
3	Component-Wise Inspection	Pipelines, pumps, valves, storage tanks, treatment units, meters, electrical panels, and control systems (all civil, electrical & instrumentation works) verified for installation completeness and workmanship.	
4	Visual Defect Check	Visual inspection for defects, leaks, incomplete works, rusting, damages, or misalignments.	
B. Technical Validation Tests			
5	Hydrostatic Pressure Test	Conducted as per standard protocols to confirm pipeline integrity under design pressure. Results recorded.	
6	Tap Connection Leak Test	All household tap connections checked for leakage or improper fittings.	
7	Flushing & Disinfection	All pipelines, storage tanks, and treatment units flushed and disinfected using approved procedures (e.g., chlorination).	

Sl. No.	*Activity/Item*	*Details/Verification Points*	*Status (✓ / X / Remarks)*
8	Flow and Capacity Test	Conducted to verify hydraulic performance, flow rates, and pressures throughout network against design values.	
9	Water Quality Testing	Chemical and bacteriological analysis conducted at source, treatment plant outlet, distribution points, and household taps.	
10	Residual Chlorine Test (RCL)	Residual chlorine levels measured at multiple points; levels within prescribed limits (0.2-0.5 mg/L).	
C. Electrical, Mechanical & Automation Systems			
11	Pump & Motor Testing	Functional testing of all pumps and motors; checking voltage, current, vibration, alignment, and noise levels.	
12	Valve & Control Device Testing / SCADA Testing	Verification of valve operation (isolation, air release, scour) and control systems under load conditions.	
13	Automation	Functional verification of automation systems, sensors, and remote monitoring (where applicable).	
14	Calibration of Meters & Sensors	Flow meters, pressure gauges, chlorine analyzers, and sensors calibrated and certified.	
15	Control System Setting	Operational parameters (timing, flow rate, alarms, process variables) set as per design requirements.	
D. Operational Validation			
16	Trial Run	Entire system operated continuously for 7-14 days to validate stability and performance.	
17	Monitoring During Trial Run	Continuous observation of water flow, pressure stability, pump performance, and water quality.	
18	Issue Identification & Rectification	Any operational problems (pressure drops, failures, water quality issues) documented and rectified.	
E. Handover & Community Readiness			
19	Joint Inspection	Conducted with engineers, contractor, GPVWSC / representatives, and community members; joint inspection note signed.	
20	IEC & Awareness Activities	IEC activities conducted to educate community on water safety, RCL importance, and system use.	
F. Documentation & Knowledge Transfer			
21	Commissioning Report	Comprehensive report prepared including test results, observations, and recommendations.	
22	O&M Manuals & Training	Operation manuals, troubleshooting guides, and maintenance schedules handed over; training provided to GP/VWSC staff.	

Notes for Implementation:

- All tests must follow BIS, CPHEEO, and Jal Jeevan Mission operational guidelines.
- Test results and calibration certificates should be appended to the commissioning report.
- The final commissioning certificate should be signed jointly by the Engineer-in-Charge/ DTU, Contractor, and Gram Panchayat/VWSC.

GAGANDEEP SINGH BEDI,
Additional Chief Secretary to Government.

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Abbreviation

S. No	*Abbreviation*	*Full Form / Meaning*
1	ASHA	Accredited Social Health Activist
2	AWC	Anganwadi Centre
3	BWS	Bulk Water Supply
4	CWSS	Combined Water Supply Scheme
5	DDWS	Department of Drinking Water and Sanitation
6	DPR	Detailed Project Report
7	DTU	District Technical Unit
8	DWSM	District Water and Sanitation Mission
9	FHTC	Functional Household Tap Connection
10	FTK	Field Test Kit
11	GPS	Global Positioning System
12	HH	Household
13	IEC	Information, Education and Communication
14	IS	Indian Standard
15	JJM	Jal Jeevan Mission
16	KPI	Key Performance Indicator
17	MoJS	Ministry of Jal Shakti
18	MoU	Memorandum of Understanding
19	MVS	Multi-Village Scheme
20	NJJM	National Jal Jeevan Mission
21	NJMP	Nal Jal Mitra Programme
22	O&M	Operation and Maintenance
23	OHT	Overhead Tank
24	PHED	Public Health Engineering Department
25	PRA	Participatory Rural Appraisal
26	PRI	Panchayat Raj Institution
27	RD&PR	Rural Development and Panchayat Raj

S. No	*Abbreviation*	*Full Form / Meaning*
28	RPWSS	Rural Piped Water Supply Scheme
29	SHG	Self-Help Group
30	SOP	Standard Operating Procedure
31	SVS	Single Village Scheme
32	TWAD Board	Tamil Nadu Water Supply and Drainage Board
33	VP	Village Panchayat
34	VWSC	Village Water and Sanitation Committee
35	WTP	Water Treatment Plant

ANNEXURES-II

Guidelines for Handing Over Protocol & Community Ownership (Jal Arpan)

1. Preamble

The Government of Tamil Nadu, in alignment with the National Jal Jeevan Mission (NJJM) guidelines of the Department of Drinking Water and Sanitation (DDWS) under the Ministry of Jal Shakti, is implementing Rural Piped Water Supply Schemes (RPWSS) across the State to ensure sustained, long-term delivery of potable drinking water to every rural household through Functional Household Tap Connections (FHTCs); AND WHEREAS the institutional transition of these newly completed water supply grids from engineering implementation entities to democratically constituted local bodies requires a structured, uniform, and legally documented handing-over protocol to establish community ownership and long-term sustainability;

NOW, THEREFORE, the Government of Tamil Nadu hereby notifies a standardized framework for the transfer of rural piped water supply schemes (RPWSS) from implementing agencies to Village Panchayats (VPs) and Village Water and Sanitation Committees (VWSCs). In accordance with the principles and implementation guidelines of the Jal Jeevan Mission (JJM) of the Department of Drinking Water and Sanitation (DDWS) under the Ministry of Jal Shakti (MoJS), this Protocol operationalizes the principles of Jan Bhagidari (people's participation) and community ownership. It ensures that water supply assets are sustainably managed by rural communities through democratically constituted local institutions.

2. Objective

This Protocol prescribes the procedure for the transfer of rural piped water supply schemes from implementing agencies to VPs or Village Water and Sanitation Committees (VWSCs) to ensure systematic, transparent, and legally documented handover processes. The Protocol aims to establish institutional mechanisms that enable VPs/VWSCs to exercise effective custodianship over water supply infrastructure, encompassing technical operations, financial management, and community engagement.

The specific objectives are:

- **Systematic Asset Transfer:** ensure systematic transfer of all in-village technical assets of rural piped water supply schemes and associated financial documentation to constituted community institutions in accordance with JJM guidelines.
- **Institutional Mechanisms:** Establish institutional and operational mechanisms for effective operation and maintenance (O&M) of all in-village infrastructure assets.
- **Service Continuity:** Ensure sustainable continuity of water supply services through evidence-based monitoring of water supply status and performance metrics.
- **Structured Transition:** Facilitate transition of operational responsibility from Government implementing agencies to community institutions (VPs/VWSCs) in a structured and time-bound manner.
- **Local Stewardship:** Foster institutional capacity, a sense of belonging, and local control over water supply systems through structured engagement and support mechanisms.

3. Scope & Applicability

These Guidelines apply to all in-village parts of rural piped water supply schemes.

- **Fully In-Village Schemes:** If the scheme is fully in-village, all assets will be handed over directly to the VP/VWSC by the Rural Development & Panchayat Raj department / TWAD Board.
- **Multi-Village / Conjunctive Schemes:** If water supplied through Multi-Village Schemes (MVS), Bulk Water Supply (BWS), or a conjunctive scheme, the VP/VWSC should know about the source, out-village parts, and their status. If out-village assets are still not completed, but in-village assets are ready, the in-village assets should be handed over only after the whole scheme is complete and working as per JJM objectives.

4. Expected Outcomes

The implementation of this Protocol is envisaged to result in:

- **Timely Documented Transfer:** Successful and documented transfer of water supply infrastructure from implementing agencies to legally constituted community institutions by the prescribed deadlines as per JJM implementation schedule.
- **Independent O&M Capacity:** Operational capacity of VPs/VWSCs to independently manage O&M activities of water supply systems with defined technical standards performance benchmarks.
- **Community Monitoring:** Established community monitoring mechanisms that enable regular assessment and reporting of water supply service continuity, quality parameters, and asset condition.
- **Sustained Institutional Engagement:** Sustained institutional engagement between community water utilities and government agencies for technical backstopping, regulatory compliance, and performance improvement.
- **Improved Viability:** Enhanced community awareness and participation in water supply system management, leading to improved system sustainability and reduced infrastructure deterioration rates.
- Documented reduction in water loss, improved revenue collection efficiency and demonstrated financial viability of water supply schemes at community level.

5. Prerequisites for Hand-Over

The transfer of in-village part of rural piped water supply schemes[1] shall be undertaken only upon fulfillment of the following prerequisites.

Pre-requisite Category	*Specific Requirements*
Infrastructure Readiness	(i) Completion of all design specifications and technical requirements as per the approved Detailed Project Report (DPR) for the respective scheme. (ii) Commissioning of all water supply infrastructure components, including treatment units, transmission lines, storage facilities, and distribution networks, in accordance with established technical and quality standards. (iii) Certification of infrastructure quality through independent third-party testing and verification as per prescribed quality assurance protocols. e.g.: Entire scheme functional from headwork/intake to each household; No major frequent breakdowns; Pumping machinery running satisfactorily; Storage tanks in required capacity and non-leaking condition; Pipeline network operational with no leakage; All pipelines functioning and discharging required water quantity/pressure
Operational and Capacity Readiness	(i) Completion of comprehensive training programmes for water operators, maintenance personnel, and administrative staff on technical operations, routine maintenance, and emergency response protocols. (ii) Completion of formal capacity building of committee members and office bearers on governance, financial management, consumer service delivery, and regulatory compliance. (iii) Establishment of operational manuals, standard operating procedures (SOPs), and maintenance schedules in written format, with translations in local languages where applicable. (iv) Appointment of duly qualified and trained water operators, Nal Jal Mitras, and support staff as per prescribed norms and eligibility criteria
Institutional Framework Establishment	(i) Formal constitution and registration of Village Water and Sanitation Committee (VWSC) or water utility entity, as applicable, with clearly defined governance structures and roles. (ii) Election of office bearers and committee members through democratic processes as per prescribed guidelines, with documented representation of marginalized and minority communities. (iii) Adoption of Gram Sabha endorsed bye-laws and operational procedures governing water supply system management, maintenance protocols, and tariff collection mechanisms. (iv) Execution of formal Hand-over Deed/Memorandum of Understanding (MoU) between implementing agency, VP/VWSC, and designated user community.

Technical Assessment	Technical Assessment Report completed with comprehensive infrastructure audit; Detailed inventory of all assets with technical specifications; Repairs/upgrades identified; Functional health evaluation of each component; GPS coordinates and photographic evidence included.
Community Awareness	(i) Orientation and Sensitisation Workshop conducted; (ii) Joint Walk-Through of entire system completed; (iii) As-built drawings shared with VWSC/VP; (iv) Water supply network diagram displayed in village
Financial Framework Establishment	(i) Finalization of operation and maintenance cost estimation and establishment of water tariff structure approved by Gram Sabha and documented through formal resolution. (ii) Establishment of dedicated bank accounts for water supply scheme management, segregated from General Fund accounts of Village Panchayat. (iii) Development of financial management and accounting procedures documented in operational guidelines with provisions for transparent fund utilization and audit compliance. Initial corpus fund provision for emergency repairs and contingencies, if applicable, as per scheme design.

Note:

[1]a) If the scheme is fully in-village, the assets of the scheme will be given to VP/VWSC by the Rural Development & Panchayat Raj Department.

[1]b) If water comes through MVS/CWSS or a conjunctive scheme, the VP / VWSC should know about the source, out-village parts, and their status. If out-village assets are still not completed, but in-village assets are ready, the in-village assets should be handed over only after the whole scheme is completed and working as per JJM objectives.

6. Trial Run Phase: Operational Validation & Community Integration

Before formal handover, a trial phase must be executed to validate system readiness:

- **Purpose & Duration** The implementing agency, supervised by DWSM, will conduct full-scale operation for 7–14 days to validate stability under actual demand variations and provide orientation to local functionaries.
- **Performance Monitoring:** Track Key Performance Indicators (KPIs) including flow rate, pressure, water quality, energy use, and system reliability.
- **Issue Identification:** Systematically detect and resolve pressure drops, pump failures, water quality deviations, or control system interruptions.
- J**oint Inspection:** (Transect Walk): Conduct a comprehensive walk-through with engineers, contractors, and VP/ VWSC representatives to verify infrastructure and sign off on readiness.
- IEC Initiatives: Conduct awareness campaigns, particularly focusing on health education, waterborne disease prevention, and community acceptance of residual chlorine.

6.1 Operate System for Trial Period

6.1.1 Purpose & Duration

(i) The implementing agency under the supervision of DWSM will conduct full-scale operation for 7-14 days or more if required locally to validate system stability, efficiency, and consistency.

(ii) Serves as final validation of the system's capacity to meet design and community expectations.

(iii) Identifies performance issues not visible during short-term testing.

(iv) During this trial run the village level functionaries such as NJMPs, VWSCs and SHGs should also be engaged for orientation and training.

6.1.2 Operational Coordination

(i) Involve all components: source pumping, treatment, storage, distribution, and household service.

(ii) Requires addressing:

- Demand variation
- System optimization
- Emergency response
- Performance monitoring

(iii) May need round-the-clock operation for effective monitoring and quick issue resolution.

6.1.3 Performance Monitoring

(i) Track key performance indicators (KPIs):

- Flow rate, pressure, water quality, energy use, system reliability, service consistency.

(ii) Collect both normal and anomalous data to detect early warning signs.

(iii) Enables preventive maintenance and optimization.

6.1.4 Community Feedback

(i) Gather feedback via surveys, meetings, consultations.

(ii) Evaluate service quality, water acceptability, reliability, and satisfaction.

(iii) Ensures community acceptance and sustainability of investment.

6.1.5 Documentation

(i) Provides baseline operational data for future benchmarking.

(ii) Used for ongoing monitoring, maintenance planning, and staff training.

6.2 Monitor System Stability, Efficiency, and Consistency

6.2.1 Purpose

Validate operational readiness and long-term viability of the water system.

6.2.2 Stability Monitoring

(i) Assess:

- Pressure maintenance and flow consistency
- Treatment process reliability
- Control system performance under varied conditions

(ii) Include hydraulic performance checks across different demand and seasonal variations.

6.2.3 Efficiency Monitoring

(i) Evaluate:

- Energy and chemical consumption
- Maintenance needs and operational costs

(ii) Especially important for solar-powered systems to ensure sustainable operation.

(iii) Check treatment efficiency to maintain quality with minimal chemical use.

6.2.4 Consistency Monitoring

(i) Focus on service reliability, pressure adequacy, water quality maintenance, and availability.

(ii) Confirms the system's ability to meet continuous service commitments.

6.2.5 Benchmarking

(i) Compare results with design parameters, regulatory standards, and similar systems.

(ii) Supports evidence-based decisions and continuous improvement.

6.3 Issue Identification–Address Pressure Drops, Pump Failures, Quality Deviations

6.3.1 Purpose

(i) Systematic detection and resolution of:

- Pressure drops
- Pump failures
- Water quality deviations
- Control system or service interruptions

(ii) Prevent small issues from escalating into major failures.

6.3.2 Pressure Drop Analysis

(i) Investigate:

- Pipeline integrity and valve operations
- Pump effectiveness and distribution balance

(ii) Use network-wide pressure monitoring for pinpointing problem areas.

6.3.3 Pump Failure Analysis

(i) Check for:

- Mechanical, electrical, or control system faults
- Common causes: motor overload, bearing wear, impeller damage, loose connections.

(ii) Implement preventive maintenance to avoid service disruptions.

6.3.4 Water Quality Deviations

(i) Review:

- Treatment and disinfection performance
- Source water variation or contamination

(ii) Ensure rapid corrective action to maintain safe water supply.

6.3.5 Documentation & Learning

(i) Record all issues, root causes, and corrective actions.

(ii) Use data to improve maintenance protocols, staff training, and future system design.

(iii) Operational manual of assets to be prepared for handing over to the VWSCs.

(iv) Disinfection protocol to be shared with SHGs/VWSCs/NJMP involved in the task.

(v) Preventive maintenance schedule for community surveillance and regular check also to be prepared and shared with the VP.

6.4 Joint Inspection–Transect Walk with Stakeholders

6.4.1 Purpose

(i) Conduct joint inspection with:

- Engineers, contractors, Village Panchayat/VWSC, and community representatives.

(ii) Ensures stakeholder consensus on system readiness before handover.

6.4.2 Benefits

(i) Enhances transparency, accountability, and community confidence.

(ii) Builds ownership and commitment to long-term sustainability.

6.4.3 Inspection Protocol

(i) Includes:

- Infrastructure verification
- Service point and connection checks
- Water quality and operational readiness assessments

(ii) Use standardized checklists and sign-off forms for documentation.

6.4.4 Documentation & Handover

(i) Signed reports confirm acceptance and responsibility transfer for operation and maintenance.

6.4.5 Training & Capacity Building

(i) On-the-spot training for community representatives on system operation and oversight.

(ii) Promotes knowledge transfer and relationship building between technical and local teams.

6.5 IEC Initiatives–Community Awareness and Residual Chlorine Acceptance

Purpose

(i) Promote awareness and acceptance of residual chlorine for safe drinking water.

(ii) Address community concerns about taste, odour, and safety through education.

6.5.1 Communication & Education Strategies

(i) Tailor content to local culture, language, and media channels.

(ii) Train community water committees for operation and maintenance tasks.

(iii) Encourage women's participation for stronger household-level acceptance

6.5.2 Health Education

(i) Focus on:

- Waterborne disease prevention
- Safe water handling
- Importance of disinfection

(ii) Demonstrate water quality testing to build trust.

6.5.3 Monitoring & Feedback

(i) Evaluate program effectiveness via behavioral changes and usage rates.

(ii) Collect feedback to refine future communication strategies.

6.5.4 Integration with Other Programs

(i) Link IEC with health, education, and development initiatives.

(ii) Collaborate with ASHA workers, schools, and self-help groups for sustained outreach.

After the scheme is successfully completed, including the trial run/defect liability period, the village can declare itself as "Har Ghar Jal" and give certificate on Jal Arpan Diwas or Handing Over Day.

6.5.5 Documents to be Shared (15-30 Days before Handover)

(i) **Asset Register/Inventory:** Comprehensive list with technical specifications; Equipment details; HH tap connection status; Component status; GPS coordinates and photos; Spare parts inventory; Items needing replacement etc.

(ii) **As-Built Drawings:** System layout from source to households; Network diagram; Pipeline routes; Storage tank locations; Control valve specifications; Treatment plant layout (if applicable) etc.

(iii) **Maintenance Schedule:** Preventive maintenance frequency; Responsible personnel; Inspection intervals; Maintenance checklists; SOPs for routine maintenance; Emergency procedures etc.

(iv) **O&M Records & Registers (Formats):** Daily operation logs; Complaint register; Breakdown records; Attendance registers; financial transaction records; Water quality monitoring records; Grievance register; Site order registers etc.

(v) **Water Quality Monitoring Records:** Historical test results; Test parameters covered; Testing frequency; District lab coordination protocols; Baseline quality status; Compliance records etc.

6.6. Trial Run –Summary:

This phase validates operational readiness and facilitates community integration.

Key Activities:

- Trial operation for 7 – 14 days minimum under actual demand conditions with continuous monitoring of flow rates, pressure levels, water quality, energy consumption and service contingency.
- System stability monitoring addressing pressure maintenance, flow consistency and treatment process reliability.
- Issue identification and resolution for pressure drops, pump failures, water quality deviations and control system malfunctions.
- Joint inspection with engineers, contractors, Village Panchayats/ VWSC representatives and Community members through transect walks.
- IEC (Information, Education, Communication) initiatives for community awareness and residual chlorine acceptance, coordinated with ASHA workers, school programs and self help groups.

7. The Jal Arpan Diwas:

The Jal Arpan Diwas shall be celebrated by the villagers to ascertain the sense of ownership among the community. This shall be celebrated as a festival of ownership. Few list of ideas (suggestive) are as follows:

- Jal Bandhan: Tying a thread around the tank/ asset or tap as a symbol of protection.
- Jal Arpan: Offering a pot of water from the source by elders.
- Pledge Ceremony: Villagers promise to maintain the system.
- Cultural Programme: Folk songs, plays, and children's speeches on water care.

Detailed step wise procedure is annexed as Annexure – 1

7.1 Stage – by–Stage Guide for Hand-Over: Celebrating Jal Arpan Diwas

The hand-over process shall be structured as a community engagement event, designated as **"Jal Arpan Diwas"** (Water Transfer Day), to mark the formal transfer of water supply infrastructure to community institutions. The activity flow comprises the following sequential stages:

Without a formal handover, villagers may not know what assets exist or how to maintain them. A well conducted handover ensures:

- All technical, financial and legal responsibilities are transferred.
- VWSC members are trained and confident.
- Documentation is complete and transparent
- Villagers celebrate ownership with pride.

Stage 1: Pre-Hand-over Assessment and Verification

(Timeline: 30 days before scheduled hand-over)

(i) Conduct comprehensive technical inspection and verification of all water supply infrastructure components against approved design specifications and technical standards.

(ii) Verify operational functionality of all mechanical and electrical components through trial operations under load conditions.

(iii) Validate water quality parameters through independent laboratory testing and ensure compliance with Indian Standards for drinking water (IS 10500).

(iv) Certify completion of all civil works, electrical installations, and mechanical fittings through authorized inspection agencies.

(v) Prepare detailed defect lists with remediation timelines if deficiencies are identified and ensure rectification completion prior to hand-over.

(vi) Verify institutional readiness including VWSC constitution, completion of training programmes, and operational staffing arrangements.

(vii) Review financial arrangements and tariff approvals through Gram Sabha resolutions.

(viii) Prepare comprehensive pre-hand-over assessment report documenting compliance status against all prerequisites.

Stage 2: Community Sensitization and Participation (Timeline: 15-30 days before scheduled hand over)

(i) Conduct awareness sessions in villages highlighting the significance of community ownership and individual responsibilities in water supply system sustainability.

(ii) Organize community meetings to explain water supply infrastructure features, operational procedures, and maintenance requirements.

(iii) Conduct orientation sessions with VWSC members and water supply committee on their roles, responsibilities, and performance expectations.

(iv) Conduct training refresher sessions for water operators and maintenance personnel covering emergency response and routine operational protocols.

(v) Establish feedback mechanisms to address community queries and concerns prior to official hand-over.

Stage 3: Documentation and Legal Formalization (Timeline: 7-15 days before scheduled hand-over)

(i) Prepare detailed Hand-over Deed/Memorandum of Understanding specifying all transferred assets, liabilities, and mutual obligations.

(ii) Prepare and execute Gram Sabha resolution formally accepting transfer of water supply infrastructure and operational responsibilities.

(iii) Document and authenticate asset inventory with photographs and technical specifications.

(iv) Prepare compliance certificates covering technical standards, water quality, environmental clearance, and statutory compliance.

(v) Prepare operational manuals and SOP documents in prescribed format with local language translations.

(vi) Finalize insurance policies, if applicable, with transfer of insurance coverage to recipient institution.

Stage 4: Official Hand-over Ceremony–Jal Arpan Diwas (Timeline: On scheduled hand-over date)

(i) Organize formal ceremony bringing together community representatives, VWSC office bearers, government officials, and implementing agency representatives.

(ii) Present asset inventory and support documentation to VWSC/VP representatives.

(iii) Conduct symbolic transfer of infrastructure keys, operational manuals, and administrative records.

(iv) Read and authenticate Hand-over Deed specifying transferred assets and mutual responsibilities.

(v) Invite community representatives to participate in ceremonial commencement of water supply to households.

(vi) Document the event with photographs and video recording for records and archival purposes.

(vii) Issue formal certificates of hand-over to VWSC/VP office bearers.

Stage 5: Post Hand-over Transition Support (Timeline: 30-90 days after hand-over)

(i) Conduct field visits by implementing agency/technical support teams to monitor operational performance.

(ii) Provide on-site technical troubleshooting and guidance for water operators.

(iii) Monitor water quality performance through periodic testing.

(iv) Facilitate resolution of community grievances and operational challenges.

(v) Provide corrective guidance on financial management and revenue collection procedures.

(vi) Conduct performance review meetings with VWSC to assess sustainability indicators.

Summary of Key Handover Principles

Before Handover	At Handover	After Handover
• Trial run for 7-14 days or more • All physical work completed and tested • Water quality certified safe • O&M staff trained with documented certificates • VWSC functional with clear leadership • Financial plan prepared with operational bank account • Community informed and committed through workshops • All documents prepared, verified, and shared	• Gram Sabha meeting conducted with full community participation • MoU signed by authorized representatives • Formal ceremony held (Jal Arpan Diwas) celebrating the transfer • Community pledge taken for sustainable management • Complete documentation with official signatures • Public recognition of community responsibility	• RD&PR Department provides three-month handholding • Monthly coordination meetings between Macro and Micro utilities • Follow-up assessments at 3 and 6 months • Refresher training organized as needed • Technical support available on-call for emergencies • Regular performance monitoring maintained • Community engagement continued through quarterly Gram Sabhas

7.2 Activity flow for Jal Arpan

The following flow chart briefly describes the procedure and steps to be undertaken for "Jal Arpan":

Step 1 - Orientation & Sensitization Workshop
Step 2 - Technical Assessment Report
Step 3 - Jal Bandhan Yatra (Joint transect walk)
Step 4 - Self-assessment Matrix
Step 5 - Financial planning
Step 6 - Special Gram Sabha
Step 7 - Jal Arpan Diwas

Tentative timeline for Handing Over

For SVS schemes or in-village Infrastructure of MVS Schemes (Activities may be required to be carried out under multiple villages)

S.No	Activities	Day 1-2	Day 3-7	Day 7-10	Day 10-12	Day 15	Till hand over
1	Orientation & Sensitization Workshop: encouragement of PRA tools						
2	Jal Bandhan Yatra or Transect Walk with Stakeholders (as and when required)						
3	Compilation and sharing of technical assessment report and detailed inventory, explaining preventive maintenance schedule etc.						
4	Focus Group Discussion with VP/ VWSC to facilitate filling up Self-assessment Matrix mentioned above in Step 4						
5	Handholding VWSC/ VP to prepare basic financial plan for O&M, encouragement for Source Sustainability through IEC etc.						
6	Opening of dedicated Bank Account of VWSC/ VP to receive funds for O&M from different sources						
7	Demonstration of FTK testing in schools and AWCs along with in VP office						
8	Jal Arpan Diwas: Setting up of Gram Sabha, signing of MoU, and declaration of Har Ghar Jal						
9	Support in Institutional Strengthening & Capacity Building of VWSC/ VP for O&M from DTU/ PHED						

7.3 Responsibility Matrix

Step	*Activity*	*Responsibility*	*Description*
1	Orientation Workshop	TWAD Board + RD&PR Department + VP + VWSC	Explains system, roles, and future responsibilities.
2	Technical Assessment Report	TWAD Board + RD&PR Department	List all assets with their condition.
3	Joint Walk-Through	TWAD Board + RD&PR Department + VWSC	Team walks from source to tap, marking critical points.
4	Self-Assessment	VWSC + VP	Verify readiness using a checklist.
5	Financial Planning	VWSC + VP	Prepare O&M plan and open account.
6	Gram Sabha & MoU Signing	VP + RD&PR Department	Formal acceptance and signing ceremony.

8. Responsibilities of Stakeholders

Responsibilities of Village Panchayat/ Village Water and Sanitation Committee/ Micro-Utility. The Village Panchayat/ Village Water and Sanitation Committee/ Micro-Utility upon receiving transfer of rural piped water supply infrastructure shall be responsible for the following:

8.1 Responsibilities of VP/ VWSC/ Micro-Utility (Refer Annexure – 2 for details)

The Village Panchayat (VP) and Village Water and Sanitation Committee (VWSC) shall serve as the primary authority for daily operation, maintenance, and service delivery of in-village water supply infrastructure.

(i) Record Maintenance:

- Maintain operational records in prescribed formats including pump operation logs, water supply schedules, and breakdown reports.
- Retain all records for audit and regulatory compliance purposes.

(ii) Infrastructure Maintenance:

- Ensure regular cleaning and disinfection of storage tanks at prescribed intervals.
- Conduct timely repair and maintenance of mechanical and electrical equipment.
- Maintain distribution pipelines to prevent water loss and system deterioration.
- Ensure timely payment of operation and maintenance personnel.

(iii) Financial Management:

- Record all financial transactions properly with supporting documentation.
- Undergo annual financial audits by authorized agencies.
- Make audit reports and financial records available for public inspection.

(iv) User Charge Management:

- Finalize and revise user charges through Gram Sabha resolution.
- Determine charges in accordance with State Operation and Maintenance Policy with technical support from PHED or designated Water Authority.
- Communicate charges to consumers via Nal Jal Mitras and display at Village Panchayat premises.
- Ensure timely collection to maintain financial viability.

8.2 Responsibilities of the Department-TWAD Board/DTU/ Macro Utility and requisite technical support (Refer Annexure – 3 for details)

(i) Serve as supervisory and technical authority for all handed-over schemes and maintain regulatory oversight.

(ii) Monitor scheme performance through regular inspections, review meetings, and technical audits.

(iii) Ensure availability of technical support including technical staff, tools, and spare parts at division or sub-division level to support VPs.

(iv) Prepare and implement capacity building plan including regular training and workshops for VWSC members on water quality monitoring, preventive maintenance, and financial management.

(v) Organize utility establishment training to develop VWSC as a sustainable water utility with professional management practices.

Note: The detailed responsibilities of all such stake holders are attached as Annexure - 2, 3 & 4

8.3 Macro & Micro utility Interface & Coordination

(i) Establish structured coordination mechanism between Macro and Micro utilities for integrated water supply management.

(ii) Maintain joint communication register documenting water delivery timings, flow rates, and quality parameters.

(iii) Follow pre-determined communication protocol for addressing disruptions and emergency situations.

(iv) Conduct regular coordination meetings to review performance indicators including supply continuity, pressure maintenance, and consumer complaints.

(v) Share digital data between Macro and Micro utilities for transparency and accountability.

(vi) Define infrastructure responsibilities: Macro-utility shall manage out-village infrastructure; Micro-utility shall manage in-village infrastructure.

(vii) Ensure effective coordination to guarantee uninterrupted and equitable water supply, particularly where in-village systems depend on out-village bulk water supply facilities.

8.4 Duties of the manpower/water operator/Nal Jal Mitra appointed for O&M of in-village Infra (Refer Annexure – 4 for details)

(i) The appointed O&M personnel will maintain cleanliness around pump houses, storage tanks, and control chambers.

(ii) They will maintain daily logs of pump operation hours, energy use, and water production.

(iii) They will check chlorine dosage daily and ensure safe storage of chemicals.

(iv) During breakdowns, they must coordinate immediately with VWSC and departmental engineers for quick restoration.

(v) Any contamination, leak, or irregularity observed must be recorded and reported promptly.

9. Post Handover responsibilities:

Primary Responsibility of Community Institution (VP/VWSC). The VP/VWSC assumes primary responsibility for:

(i) Day-to-day operation and management of water supply infrastructure.

(ii) Routine and preventive maintenance of all infrastructure components.

(iii) Financial management and revenue collection from consumers.

(iv) Resolution of consumer complaints and grievances.

(v) Community engagement and participation facilitation

(vi) Assign the NJM/operator duties formally.

(vii) Send monthly updates to the DTU.

State Department/DWSM/ District Technical Unit shall assist for:

(i) Technical backstopping and troubleshooting support.

(ii) Capacity building and skill enhancement programmes.

(iii) Regulatory oversight and performance monitoring.

(iv) Access to government welfare schemes and support programmes.

(v) Linkages with financial institutions for capital expenditure requirements.

10.Post-Handover Review.

10.1 Review Mechanism and Frequency

Post hand-over review of transferred water supply schemes shall be conducted through structured monitoring and assessment processes:

10.2 Periodic Performance Review

(i) Conduct formal performance reviews for 3 to 6 months following hand-over.

(ii) Review meetings shall be convened by District Water Unit with participation of VWSC representatives, technical support staff, and community representatives.

(iii) Performance review shall assess achievement of prescribed service standards and sustainability indicators

10.3 Performance Assessment Criteria:

Performance reviews shall assess achievement of following key indicators:

(i) **Water Supply Continuity:** Hours of daily supply, reliability of supply, and frequency of service interruptions.

(ii) **Water Quality Compliance:** Achievement of prescribed water quality parameters and frequency of water quality testing.

(iii) **Financial Performance:** Revenue collection efficiency, adequacy of collected revenue for operational sustainability, and financial viability.

(iv) **Infrastructure Condition:** Assessment of asset conditions and identification of maintenance requirements.

(v) **Community Participation:** Evidence of community engagement, Gram Sabha participation rates, and grievance resolution.

(vi) Institutional Capacity: Assessment of VWSC operational capacity, staff capability, and governance effectiveness.

10.4 Review Documentation and Corrective Action

(i) Document findings of post hand-over review in prescribed formats.

(ii) Identify performance gaps and constraints limiting achievement of service standards.

(iii) Prepare corrective action plans addressing identified performance gaps with timelines and responsibility assignments.

(iv) Support implementation of corrective action plans through technical guidance and resource provisioning.

(v) Conduct follow-up reviews to verify implementation of corrective actions.

11. Annexures to be included in Handing Over Document

The Annexures should include technical details, system layout diagrams, and standard formats for O&M registers. Each technical detail—like pump discharge, head, power rating, and pipeline pressure—should be measured, recorded, and checked by departmental officials. The preventive maintenance schedule should show when inspections happen, who is responsible, and how to record them. The appendix will be a live document, updated regularly to show changes in assets or operations.

Technical Assessment Report must include the following:

- Key details of the scheme showing the working condition of each component.
- Details of each component, such as the type of head work, size and length of pipelines, type, make and capacity of pumps and accessories, type, size and location of control valves, capacity and location of WTPs and storage tanks, signed by a department official.
- Preventive maintenance and inspection schedule, along with the responsibilities of the VWSC.
- Details of manpower already deployed by the department for O&M of the scheme, including monthly costs.
- Water quality monitoring protocol as issued by NJJM and updated guidelines from time to time.

It should be noted that the VP can employ people or NJM for O&M as per their choice, according to the need. The number of skilled and unskilled workers can be decided together by the TWAD Board / RD&PR Department and the VP.

ANNEXURES

Annexure – 1: Detailed Step wise procedure for Jal Arpan

Step 1: Orientation & Sensitization Workshop

- Before giving any rural drinking water supply asset for O&M, the RD & PR department/ TWAD Board/ macro-utility should organize an Orientation & Sensitization Workshop with the concerned VPs/ VWSCs/ User group.
- The purpose of this workshop is to explain the current situation (‘as-is’) and the future plan (‘to be’) of drinking water supply in the village or area. The department staff should also tell the participants about the responsibilities of the VP/ VWSC/ User group from now on.

- A list of attendees and the minutes of the meeting should be written down and signed by the Panchayat President/ VWSC Nodal and the department staff. Both sides should keep a copy.
- During the workshop, the department should show visual aids, diagrams, and sample O&M registers. They can also do practical demonstrations on pump and valve operation, chlorination, and grievance redressal procedures.
- The workshop should explain the SOPs for routine maintenance, safety rules for pump operators, and reporting formats. All discussions and questions should be written down, and photos of the session should be attached to the record for verification.

Step 2: Technical Assessment Report

- During the Orientation & Sensitization Workshop at district, block, or village level, the RD & PR department/ TWAD Board/ macro-utility should share and explain a Technical Assessment Report (Appendix-1) with the VP/ VWSC/ User group.
- This report gives a full check of the water supply system in the village/ VP, including the condition of pumps, storage tanks, and distribution networks. The department should also share a detailed list of all assets, including their technical details, number of FHTCs, maintenance records, water quality reports, and warranty information.
- The Technical Assessment Report and the asset inventory should be made and signed by both the VP representative and the department.
- The department/ DTU should also guide the VP/ VWSC about how many O&M staff are needed and their responsibilities. One copy of the report should be given to the VP and one copy kept by the District Technical Unit/ RD&PR Department.
- The report should also include photos, GPS locations, and visual proof of the assets. The department can use a standard checklist to check things like the strength of tanks, working of control valves, water meters, and protection of water sources.
- The inventory should also show spare parts, items under warranty, and things that may need replacement, which VP/ VWSC will maintain later.
- This report will be the base for all future O&M checks and must be signed and dated by both parties.

Step 3: Jal Bandhan Yatra (joint transect walk)

- After the above workshops, a joint 'transect walk' or Jal Bandhan Yatra should be done with members of the VP/ VWSC/ User group and the RD & PR department/ TWAD Board/ DTU officials. This Yatra should be done respecting local customs and rituals and in the presence of public representatives.
- All comments and observations during the walk should be recorded, and the department and VP should keep a copy. During this visit, the department should also give the 'As-built' drawing to the VP/ VWSC.
- The walk should cover all assets from the water source to household taps.
- Department staff should show VP/ VWSC members how to find problems like pipe leaks, low water pressure, or valve issues. All important points should be marked on the As-built drawings, and photos should be taken and added to the transect walk report.
- This walk helps the local people learn by doing and understand the water system layout.

NOTE: The water supply network diagram should be displayed at a prominent place in the village.

Step 4: Self-assessment Matrix

The following Self-assessment Matrix to be filled by the VP /VWSC to whom the drinking water supply assets/ infrastructure are being handed over

S.No	*Criteria*	*Yes*	*No*	*Action point*
1	Was there any Orientation and Sensitisation Workshop/ Meeting with suggestive activities?			
2	Was there a joint 'Transect Walk with suggestive activities?			
3	Is the "As built" drawing available?			
4	Is there a list of assets, items and/ or inventories prepared which are being handed over?			

S.No	*Criteria*	*Yes*	*No*	*Action point*
5	Do the area of service fall within the jurisdiction of the VP/ village? (Note: The source, WTP, gravity main etc. can however be outside the jurisdiction of village/ VP)			
6	Is the entire assets functioning satisfactorily without any record of major/ frequent break down that require intensive technical supervision?			
7	Does the scheme have properly protected source?			
8	Does the WTP (if there) have adequate capacity and running in acceptable working condition?			
9	Do the storage tanks have required capacity, non-leaking and in satisfactory condition?			
10	Is the pipeline network including distribution in operational condition with no leakage?			
11	Are the pumping machineries running satisfactorily?			
12	Have the personnel/ NJMP been identified for regular O&M on day to day basis?			
13	If yes, is the number of identified personnel/ NJM for regular O&M within the jurisdiction of the VP/ VWSC sufficient?			
14	Whether NJM is from the same village?			
15	If yes, is/ are the identified personnel adequately trained/ handheld for regular O&M?			
16	Do the identified personnel for regular O&M have requisite tools, if needed?			
17	Is the VP/ VWSC aware of the preventive maintenance schedule and the exact responsibility?			
18	Is the VP/ VWSC aware of the average O&M cost per month and its different components?			
19	Is there a resolution passed by the VP/ VWSC to collect user charge?			
20	If yes, is it sufficient to run the O&M by VP/ VWSC?			
21	Has the VP/ VWSC been handheld about a viable financial plan?			
22	Does the VP/ VWSC have people identified to manage the plan?			
23	Whether all households in the village are connected through FHTC?			
23a	If not, number of households not connected			
24	Whether all schools and Anganwadis in the village are connected?			
24a	If not, number of schools and Anganwadis not connected			
Whether accepted or not: **Remarks (If any)**				

While filling the Self-assessment Matrix, the VP/ VWSC should involve all important people, including O&M staff, ward members, and local community representatives, to make sure the information is correct and complete. Each ‘Yes’ or ‘No’ answer should have some proof or remarks, such as existing tools, training certificates, or financial readiness documents. This self-assessment helps the VP/ VWSC check and confirm their readiness before the official handover of the water supply assets.

Step 5: Financial Planning

- A financial plan for the O&M of the water supply assets should be prepared, focusing on recovering costs through user charges. A separate bank account should be opened by the VWSC or VP for managing the O&M funds. The Village Panchayat or its sub-committee, like VWSC/ Paani Samiti/ User Group, will open this account to receive money from different sources. The RD&PR department/ Macro Utility/ DTU will guide the VP/ VWSC in preparing this plan.
- The financial plan should clearly show where the money will come from, such as user charges, VP funds, or state grants. It should also include monthly and yearly expenses for electricity, staff wages, repair materials, and chemicals. The plan should explain how to keep financial records, report money spent and follow audit rules.
- The plan should also include regular auditing of the VP or sub-committee accounts, with help from retired local audit officials. Finally, this financial plan should be reviewed and approved at the start of each financial year.

Step 6: Special Gram Sabha and MoU signing

After successfully completing all the previous steps, a special Gram Sabha should be organized and facilitated to discuss and accept the process of handing over the water supply assets to the community. During this meeting, the exact responsibilities of the VP/ VWSC/ User group will be clearly explained to ensure proper management of resources. The aim is to help the community make informed decisions and improve drinking water resource management at the local level.

Once the community agrees to take on the O&M responsibilities of the in-village infrastructure, a MoU may be signed between the department/ Macro Utility and the VP. The Gram Sabha should be used as a platform to communicate details of all water supply infrastructure, the scope of the handover, the O&M responsibilities, and the benefits of local ownership. The MoU should clearly define obligations, reporting channels, escalation mechanisms, and performance indicators. Minutes of the meeting, along with a resolution of acceptance, must be formally recorded. The department will conduct follow-up reviews at 3 and 6 months to check compliance and provide refresher training if necessary.

Step 6(a): The Gram Sabha may also be organized to take stock of O&M after 3 months or 6 months and endorse water security and sustainability plans. This ensures that water is managed efficiently as part of local governance and everyday community practice. The Gram Sabha may request the department/ Macro Utility to provide handholding support or refresher training for O&M personnel from time to time.

The Gram Sabha continues to be a platform to communicate the scope of handover, O&M responsibilities, and benefits of local ownership. The MoU should clearly define obligations, reporting channels, escalation mechanisms, and performance indicators. Minutes of the meeting and the resolution of acceptance must be formally recorded. The department will continue follow-up reviews at 3 and 6 months to ensure proper compliance and provide refresher training when needed.

Annexure 2: Detailed Responsibilities of VP/VWSC/Micro-Utility

(i) VP/ VWSC shall prepare a schedule of daily water supply timings.

(ii) VP/ VWSC shall maintain record of daily supply including operation of source, WTP, filling of sump/ OHT, supply of water to various pockets etc.

(iii) VP/ VWSC shall maintain a register of complaints, action taken and cost (if any) on them along with outcome.

(iv) VP/ VWSC shall maintain a record of breakdowns indicating the time and duration of break down on the specified format.

(v) VP/VWSC or its dedicated team shall oversee the day-to-day working of O&M staff/s, which shall flag/ report the irregularities, if any, to the VP for taking necessary action.

(vi) VP/ VWSC shall maintain a record of misuse of water by individual or user group and shall take suitable action at respective level.

(vii) VP/ VWSC shall maintain all records like attendance registers of the workers, their wage bills, payment and all other transactions of any type in the O&M of scheme.

(viii) A site order register of the scheme shall be opened and maintained by the VP/ VWSC in which remarks of the inspecting officer/member shall be recorded.

(ix) The procurement of all materials, fittings etc. shall be done by the VP and its fixing or replacement shall be done by the NJM personnel/ workers employed for O&M purpose.

(x) The payment to all skilled as well as unskilled workers shall be made by the VP. by using funds generated and/ or grants given by the State Govt.

(xi) All routine and minor repairs shall be done by the VP while major/ special repairs/ replacement shall be done by the department unless otherwise allowed by the PHED. The special repair means any major disruption in the scheme such as damage to main pipelines, storage tanks, treatment plants, intake and source of water due to any event, natural or man-made.

(xii) VP shall ensure a proper quality of water in the system and its regular monitoring involving FTK users and coordinating with the nearest district laboratory.

(xiii) VP to maintain a record of all private connections.

(xiv) No change addition, alteration or modification in the system in any form can be done by the VP without the approval of competent authority from the RD&PR Department/ Macro Utility.

(xv) Any other work that is necessary to ensure the quantity, quality and regularity of the drinking water, in each household of the respective village/ VP, on sustainable basis.

(xvi) A grievance register has to be maintained.

Annexure 3: Detailed Responsibilities of the Department –TWAD Board/DTU/ Macro Utility and requisite technical support

The Department/ Macro Utility shall act as a facilitator to maintain uninterrupted drinking water supply. However, the following activities shall be done by them:

(i) Inspect the scheme regularly and issue necessary observations and guidelines.

(ii) Ensure an inventory of items required for day-to-day maintenance.

(iii) Periodic discussion, preferably once every month, involving the department officials with the VP shall be conducted to resolve difficulties, if any, and the observations of the inspecting engineers shall be attended to.

(iv) Maintain records of all events and changes in the schemes and shall carry out regular evaluation of the policy of transfer of schemes.

(v) Training, awareness and/ or capacity building of the members of the VWSC/ Micro Utility/ PRIs or the people deployed for O&M of the transferred schemes as per training calendar.

(vi) At the beginning three-month long handholding and supervision may be ensured by the department. Then refresher training may be planned at least once in a year.

(vii) All technical reports, estimates, designs, drawings etc. shall be prepared at the department/ Macro Utility level as and when any major work is proposed/ felt.

(viii) All technical supervisions and time to time guidance on O&M activities.

(ix) Technical support in the management of crises/ natural disaster. The evaluation studies if proposed at any time by the competent authority.

(x) Necessary assistance and guidance to maintain the records of the scheme performance and its O&M.

(xi) Make available copies of acts/ rules/ regulations and latest amendments and instructions to the VPs.

Furthermore, a back-up maintenance team may be constituted at every PHED section/ DTU/ Macro Utility level to function under the guidance and control of engineers concerned to look after the sudden/ major/ special repairs of the schemes transferred to PRIs.

Annexure 4: Detailed Duties of the manpower/water operator/Nal Jal Mitra appointed for O&M of in-village Infra

(i) Regulating the flow, opening and closing of valves in distribution system daily/ as per schedule

(ii) Ensure required chlorination of the sector storage tanks alongside periodical cleaning as specified by the RD&PR department.

(iii) Check for the status of scouring and then proper close out of wash out valves.

(iv) Check for leakage through pipes and take necessary action.

(v) Check for the status of manhole cover over the storage tank and chamber covers.

(vi) Inspect possibilities of contamination, if any, of the distribution system and storage tanks.

(vii) Update the status of requisite chemicals to RD&PR department as per schedule.

(viii) Check for any misuse/ pilferage of drinking water and bring it to the notice of VP/ VWSC.

(ix) Report any disruption in water supply to the VP/ VWSC and RD&PR

Task Frequency Check - List

Task	*Frequency*	*Completed (Yes/No)*
Check water supply system functionality (pumps, valves, pipelines)	Daily	
Ensure water reaches all households as per schedule	Daily	
Record water supply timings and quantity	Daily	
Clean and inspect overhead tanks and storage reservoirs	Weekly	
Check for leakages or damages in the distribution system	Weekly	

Task	*Frequency*	*Completed (Yes/No)*
Submit weekly report to VP/ VWSC	Weekly	
Perform preventive maintenance of pumps and electrical systems	Monthly	
Update maintenance and repair logs	Monthly	
Collect feedback from villagers on water supply issues	Monthly	
Collect user charges	Monthly	
Attend to breakdowns or complaints immediately	As-Needed	
Coordinate with VP/VWSC/TWAD Board/ RD&PR Department for major repairs	As-Needed	
Support VWSC in planning new connections or system upgrades	As-Needed	
Participate in training or refresher courses	As-Needed	

GAGANDEEP SINGH BEDI,
Additional Chief Secretary to Government.

PRINTED AND PUBLISHED BY THE COMMISSIONER OF STATIONERY AND PRINTING, CHENNAI
ON BEHALF OF THE GOVERNMENT OF TAMIL NADU