Ensuring drinking water safety

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Madhya Pradesh is moving towards ensuring drinking water safety through accreditation of water testing laboratories and strengthening community level water quality surveillance systems

Jal Jeevan Mission (JJM) has been launched with the aim to provide Functional Household Tap Connection (FHTC) to every rural household by 2024. JJM focuses on service delivery at household level, i.e. water supply on regular basis in adequate quantity and of prescribed quality (BIS:10500). Water testing is important for monitoring the operation of water supply, verification of the safety of drinking water, investigation of disease outbreaks, validation of process and preventing measures. Water quality testing tools needs to be used for deciding the safety of drinking water at source, within distribution system and at consumer level. Drinking Water quality monitoring and surveillance are distinct, but closely related activities. PHED (Public Health Engineering Dept) plays important role in drinking water quality monitoring through network of water testing laboratories and empowering communities in establishing community level water quality surveillance systems.

Madhya Pradesh has a network of 155 water testing laboratories working under Public Health Engineering Department. Overall Madhya Pradesh water testing laborites includes one state level laboratories, 51 district level laboratories and 103 subdivision laboratories. These laboratories are supporting overall water quality monitoring across the State as per guidelines laid down in Uniform Drinking Water Quality Monitoring protocols launched in March 2019 and in line with JJM operational guidelines. Along with implementing the schedules for drinking water testing, these laboratories are open for common public for water testing on nominal fees. Physical, chemical and bacteriological parameters are analyzed in these laboratories as per test procedures laid down in relevant parts of IS: 3025 and/or APHA 23rd Edition.

Public Health Engineering Department (PHED) in Madhya Pradesh embarked on the journey to strengthen overall performance of the existing water quality testing laboratories. The initiative focused on strengthening standard protocols and procedures for testing and feedback, build trust in testing/ calibration, enhanced service levels and improved confidence and satisfaction on reliability of water

testing results. MP PHED along with UNICEF worked on multi faced strategies in order to strengthen Water Quality testing laboratories across the State. In order to achieve standard service level, all the District Water Testing Laboratories of the State have accelerated the actions to get the accreditation in line with ISO/IEC 17025:2017 from National Accreditation Board for Testing and Calibration Laboratories (NABL), an autonomous body. The NABL provides third party assessment of the quality and technical competence of testing and calibration laboratories. NABL is a signatory to International Laboratory Accreditation Committee (ILAC) Arrangements and Asia Pacific Laboratory Accreditation Committee (APLAC), Mutual Recognition Arrangements (MRA), based on mutual evaluation and acceptance of other MRA Partner laboratory accreditation systems. NABL accreditation of Water Testing Lab thus provides the status of testing results internationally acceptable.

Following are key interventions resulting in improvements of water quality monitoring and surveillance in Madhya Pradesh:

Strengthening Standard Operating Procedures and Protocols and services for water quality monitoring:

Public Health Engineering Department of MP has developed and finalized the Standards and specification for consumables such as glasswares and chemicals in order to facilitate the unified procurement. This enabled smooth and uninterrupted supply.

Strengthening capacities of PHED functionaries:

Capacity building of key functionaries including lab technicians, engineers and sample collectors (majorly hand pump mechanics in case of MP) were taken up by PHED based on rapid capacity needs assessments. Four day training of laboratories functionaries organized in July 2015, as per ISO/IEC 17025:2005 focusing majorly on water quality parameters, standards and procedures in laboratory. This resulted in accreditation on State Water Quality Research Laboratory, Bhopal and District Laboratory, Ratlam. This accreditation led to confidence of State in overall approach and scale up. Subsequently, in November 2017, ISO/IEC 17025:2017 waslaunched and State initiated the large-scale capacity building with the objective to upgrade the quality monitoring procedures across the State. Following are key capacity building interventions executed:

- PHED and UNICEF prioritized 13 district laboratories (Sehore, Bhopal, Betul, Dhar, Indore, Chhatarpur, Narsinghpur, Chhindwara, Jabalpur, Gwalior, Mandsour, Neemuch and Shajapur) and skilled 40 lab functionaries on ISO/IEC 17025 in 2019. The Capacity building focused on identification on risks/opportunities and mitigation measures, decision rules, measurement of uncertainty, standard procedures for sampling and testing, reporting of results and corrective measures back to community, resource assessment and planning for improvements. This resulted in advancing actions related to lab function improvements.
- In order to further scale-up Lab upgradation and NABL accreditation across the State, 220 Executive Engineers, Assistant Engineers and Lab Functionaries skilled on ISO/IEC 17025 2017 with support of Quality Council of India in six batches through detailed 15 hours per batch online training course. The training resulted in enhanced knowledge and skills on water quality monitoring standards and procedures, interpretation of the standard, internal audit, and NABL accreditation processes. This training was followed by series of webinars and face to face orientations organized by PHED and UNICEF focusing on needs based technical issues, identifying statewide as well as lab specific challenges and identifying supporting actions both at district and State levels as well as any technical issues like z-score calculation, calibration and measurement of uncertainty. This helped laboratories in swiftly moving for overall improvement and compliance for NABL accreditations.
- Once the laboratories attained a level of improvement, 137 Engineers and lab functionaries of 51 district laboratories were got skilled and trained on registration process, decision rule, proficiency testing, documentation and analytical issues. This has resulted infilingapplication on all 51 laboratories for NABL accreditation.

Laboratory based comprehensive gap assessments and improvement planning:

Comprehensive Gap Assessment and Improvement planning template was developed, and laboratory wise gap assessment and planning completed for all the laboratories. The assessment and planning focused in the areas of manpower, their competency, infrastructure and resources. This exercise led to identification of key areas of improvements and prioritizing long term, medium term and short-term goals for each laboratory. The assessment also facilitated State and District level actions for improvement

of services within laboratories and also focused on the need for updating of standards and procurement procedures for consumables.

Technical Handholding support for strengthening testing procedures and documentation: State level technical resource group and zonal level officers deployed expert lab functionaries, officials and technical consultant provided by UNICEF. This expert group provided handholding support to laboratories in improvement of services, infrastructures, procedures and documentations. The supportive supervision also provided opportunity to advocate at district level for resource mobilization and enhance sampling and feedback of results at community level.

Face to face dialogue with NABL to build confidence of PHED functionaries:

One day face to face dialogue organized with Shri N. Venkateswaran, CEO, NABL and Mr. Malay Shrivastava, Additional
Chief Secretary, PHED, GoMP on 22nd January 2021 with an objective to encourage the PHED functionaries for NABL accreditation in a bid to attained and maintain the standards of water quality monitoring across State. This workshop provided opportunities to over 80 PHED functionaries in directly getting clarity on accreditation procedures and more importantly raising practical issues.

Connecting water quality monitoring by laboratories and water quality surveillance at community level:

Public Health Engineering Department also focusing on linking water quality surveillance at community level and water testing at laboratories. Community members especially women and village water and sanitation committee members are being skilled across State. State is focusing on promoting use of Field-Testing Kits at villages level to know the typeof contamination and refer the positively tested samples to the nearby water quality testing laboratory for confirmation; sanitary inspections to identify and evaluate factors associated with drinking water that may pose a risk to health. Various awareness programmes at community and institutional levels (schools, AWCs) are being organized across State on water quality.

Sustained efforts and initiative led to implementation of lab improvement plans across 50 district level laboratories and all district laboratories participated and successfully completed proficiency testing in 94% parameters.

As state level lab and District Lab Ratlam were already accredited; additional 27 District Labs accredited to NABL protocols by 31st March 2021, the highest number achieved by a State in the year.

Madhya Pradesh continues its focus on sustaining the water quality monitoring through achieving high standards in water testing and bringing overall credibility of lab functioning for general public to achieve access to safe water for all. Community empowerment for water quality surveillance, safety of source and water safety behaviour at household level will take a center stage effective roll-out of Jal Jeevan Mission in the State.