Chapter-V

Monitoring and Surveillance of Water Quality, Manpower Management and Internal Control and Monitoring

CHAPTER-V

Monitoring and Surveillance of Water Quality, Manpower Management and Internal controls & monitoring

A - Water Quality Monitoring and Surveillance

Water testing is important for monitoring the quality of water supply, verification of the safety of drinking water, investigation of disease outbreaks, as a validation process and to undertake preventive measures. Water quality testing tools need to be used for deciding safety of drinking water at the source; within the piped distribution system; or at the point of supply to consumers. Under Water Quality Monitoring and Surveillance (WQMS) component of National Rural Drinking Water/ Jal Jeevan Mission, water quality laboratories were to be set up and upgraded at State, district and sub-district levels. For setting up/ upgrading laboratories, three *per cent* of NRDWP funds were released to the State while two *per cent* of JJM funds were available for the purpose.

The Department had not set up its own State Level Water Testing Laboratory. A private laboratory was designated as a State Level Water Testing Laboratory and 43 (out of 59) laboratories were having accreditation from NABL as of March 2022.

5.1 Setting-up of water quality testing laboratories

As per JJM guidelines, five *per cent* of tested samples by the district laboratories were to be tested at State laboratories. The aim was to provide safe and adequate drinking water through individual household tap connections to all rural households. As per NRDWP/ JJM guidelines, water quality tests of all drinking water sources are to be conducted at least twice a year for bacteriological contamination and once a year for chemical contamination. The DWSM was also to plan for drinking water testing laboratories to obtain accreditation from National Accreditation Board for Testing and Calibration Laboratories (NABL).

Audit noticed that:

(i) The Department had not set up its own State Level Water Testing Laboratory as of March 2021. However, a private laboratory[1] was designated (March 2016) as a State Level Water Testing Laboratory. The department was unable to conduct required number of water quality tests through the designated State Laboratory.

During the exit conference (December 2022), it was informed that State laboratory had been set up at Dharampur in Mandi district which would be made functional soon.

(ii) Out of total 59 departmental laboratories (district laboratories: 14 and sub-divisional laboratories: 45), 43 laboratories (district laboratories: 14 and sub-divisional laboratories: 29) were having accreditation from NABL as of March 2022.

The Chief Engineer (S&I) stated (March 2022) that process for obtaining NABL accreditation for remaining laboratories was in progress.

[1] M/s Eco laboratories and Consultant Pvt., Ltd. Mohali.

5.2 Availability of required Infrastructure in laboratories

Details of equipment/ infrastructure required as per Uniform Drinking Water Quality Monitoring Protocol (UDWQMP) issued by Ministry of *Jal Shakti*, Government of India and actual available in the water quality testing laboratories in the 20 test-checked divisions are given in **Tables-5.1**, **5.2** and **5.3** below.

Table-5.1
Details of availability of recommended equipment in the 20 laboratories of test-checked divisions

Sl. No.	Equipment required	Number of laboratories having required equipment	Number of laboratories not having required equipment (*per cent*)
1.	pH meter (both lab based and potable type)	15	5 (25)
2.	TDS/ conductivity meter (both lab based and potable type)	17	3 (15)
3.	Nephelometer (turbidimeter)	20	0
4.	Digital balance	20	0
5.	UV - Visible Spectrophotometer	13	7 (35)
6.	Refrigerator	20	0
7.	Water still	10	10 (50)
8.	2 Voltage stabilizer / Inverters	3	17 (85)
9.	1 Hot plate	20	0
10.	Heating mantle	5	15 (75)
11.	Water Bath	16	4 (20)
12.	2 Hot air ovens	6	14 (70)
13.	2 Bacteriological Incubator	8	12 (60)
14.	1 Autoclave	20	0
15.	1 Magnetic stirrer	17	3 (15)
16	Vacuum pump	14	6 (30)
17.	UV laminar Air flow chamber for bacteriological analysis	14	6 (30)
18.	Plate count and colony counter	6	14 (70)
19.	Cool box with icepacks	4	16 (80)
20.	Specific ion meter along with electrodes (for Fluoride and Nitrate etc.)	1	19 (95)
21.	Auto Burette & Auto pipette	11	9 (45)
22.	Thermometers	20	0
23.	Single stage distillation Apparatus	11	9 (45)
24.	Double distillation Apparatus	17	3 (15)
25.	Centrifuge	3	17 (85)

Source: Information supplied by the Department.

The EEs of divisions concerned stated that water tests are conducted through Field Testing Kits (FTKs) where required equipment were not available. However, as per Para 5.1.1 of UDWQMP, all positively tested samples using FTKs were to be referred to the nearest district/ sub-divisional water quality testing laboratory for confirmation. Thus, tests conducted through FTKs were not considered reliable.

The details of availability of recommended equipment of specific utility in the eight District laboratories are given in **Table 5.2**.

Table-5.2
Details of availability of recommended equipment of specific utility in the eight District laboratories

Sl. No.	Equipment required	Number of district laboratories having required equipment	Number of district laboratories not having required equipment (*per cent*)
1.	Microscope	5	3 (38)
2.	Flame protector	0	8 (100)

Sl. No.	Equipment required	Number of district laboratories having required equipment	Number of district laboratories not having required equipment (*per cent*)
3.	Fume cup board	1	7 (88)
4.	Argon, Nitrogen & Oxygen gas cylinders	0	8 (100)
5.	Kjeldahl distillation apparatus	0	8 (100)
6.	Pressure pump	1	7 (88)
7.	Membrane filtration	6	2 (25)

Source: Information supplied by the Department.

Table-5.3
Details of availability of required infrastructure in the laboratories of 20 test-checked divisions

Sl. No.	Infrastructure required	Number of laboratories having required infrastructure	Number of laboratories not having required infrastructure (*per cent*)
1.	Space availability (80 sq.m)	09	11 (55)
2.	Availability of computers	18	02 (10)
3.	Availability of internet	14	06 (30)
4.	Availability of UPS	11	09 (45)
5.	Availability of Inverters (for back up)	02	18 (90)
6.	Printer	17	03 (15)
7.	Telephone facility	05	15 (75)
8.	Air Conditioners	11	09 (45)
9.	Provision of Gas (LPG)	Nil	20 (100)

Source: Information supplied by the Department.

Thus, the laboratories were not equipped with recommended equipment/ infrastructure to carry out the bacteriological and chemical tests at district and sub-district levels.

The Department accepted the facts and assured (December 2022) for review and monitoring of availability of equipment/ infrastructure.

Against the required 84,000 water quality tests to be conducted by 14 District laboratories, only 56,238 samples were got tested during 2019-21. Tests of required 11 (out of 13) water quality parameters had not been conducted in one to 18 test-checked laboratories. The targets of tests fixed during 2016-21 were not commensurate with the quantum of the chemical and bacteriological tests required to be conducted. In the results of 209 water quality samples tested (between May 2016 and February 2021), coliform was observed in five test-checked divisions. Variations in water sample results between two laboratories of a scheme were observed. In two test-checked divisions, expired field testing kits were issued.

5.3 Water quality tests conducted

(i) Tests conducted in District laboratories and State laboratory

As per JJM guidelines, district laboratory was required to test 250 water sources/ samples per month covering all sources randomly spread geographically including the positively tested samples referred by the sub-division/ mobile laboratory for at least 13 basic water quality parameters and five *per cent* of tested samples by the district laboratories were to be cross verified at State laboratories.

Against the required 84,000 water quality tests to be conducted by 14 District laboratories, only 56,238 samples were got tested during 2019-21. The shortfall in achievements of

required tests during 2019-20 and 2020-21 ranged between 32 and 35 *per cent*. Similarly, against the required 2812 water quality cross verification tests to be conducted, only 50 samples were got tested in the designated laboratory during 2019-21 as per details given in **Table 5.4**.

Table-5.4
Details of water quality tests conducted in the district laboratories and designated State laboratory during 2019-21

(Tests in numbers)

Year	No. of district laboratories	Tests required to be conducted by district laboratories	Tests actually conducted by the district laboratories	Shortfall (*per cent*)	Tests required to be conducted by State laboratory	Tests actually conducted by State laboratory	Shortfall (*per cent*)
2019-20	14	42000	28751	13249(32)	1438	27	1411(98)
2020-21	14	42000	27487	14513(35)	1374	23	1351(98)
Total		**84000**	**56238**	**27762(33)**	**2812**	**50**	**2762(98)**

Source: Information supplied by the Department.

(ii) Testing of water quality parameters in laboratories

As per provisions of the Uniform Drinking Water Quality Monitoring Protocol (February 2013)**,** NRDWP and JJM, 13 water quality test parameters were required to be analysed in water testing laboratories in the State.

The details of testing of water quality of the required parameters in the 20 test-checked laboratories are given in **Appendix-4** and parameter-wise details of water quality tests being done in test-checked laboratories are depicted in **Table 5.5**.

Table-5.5
Details of parameter-wise water quality test conducted in test-checked laboratories

Sl. No.	Parameter required	No. of test-checked laboratories which conducted tests on the required parameter	No. of laboratories which had not conducted tests
1.	Potential hydrogen (pH)	20	Nil
2.	Turbidity	19	01
3.	Total dissolved solid (TDS)	19	01
4.	Total hardness	20	Nil
5.	Alkalinity	19	1
6.	Fluoride	08	12
7.	Chloride	19	01
8.	Sulphate	04	16
9.	Nitrate	09	11
10.	Arsenic	02	18
11.	Iron	14	06
12.	Total coliform	18	02
13.	E coli	13	07

Source: Information supplied by the Department.

It can be seen from above table that tests of required 11 (out of 13) water quality parameters had not been conducted in one to 18 (out of 20) test-checked laboratories (Arsenic: 18 laboratories; Sulphate: 16 laboratories; Nitrate: 11 laboratories; Fluoride: 12 laboratories, E. coli: seven laboratories and Iron: six laboratories).

The EEs of divisions concerned stated (August 2021-March 2022) that parameters were not tested due to non-availability of equipment and shortage of staff.

The Chief Engineer cum Director In-charge (S&I) informed (March 2022) that targets have been fixed for water quality tests as per annual action plans. However, the fact remains that the department had not fixed adequate quantum of targets of water quality tests as per JJM guidelines to draw assurance for water quality. The department could achieve only two *per cent* of the tests required, as per JJM guidelines, for water quality tests as indicated in **Table 5.4**.

(iii) Testing of water source for bacteriological and chemical contamination

As per NRDWP/ JJM guidelines, water quality tests of all drinking water sources are to be conducted at least twice a year for bacteriological contamination and once a year for chemical contamination. The details of water quality tests of water sources required to be conducted in the State, targets fixed and achievements thereof during 2016-21 are given in **Table 5.6**.

Table-5.6
Details of water quality tests of water sources required to be conducted in the State, targets fixed and achievements thereof during 2016-21

(Tests in numbers)

Year	Number of water sources	Chemical and bacteriological tests			
		Tests required as per guidelines	Targets fixed by State	Achievement	Excess (+) Shortfall (-) (*per cent*)
2016-17	1,53,722	4,61,166	66,000	71,344	(+)5,344 (8)
2017-18	1,56,091	4,68,273	75,000	78,144	(+)3,144 (4)
2018-19	1,55,440	4,66,320	77,000	76,419	(-) 581(01)
2019-20	1,55,992	4,67,976	1,32,000	1,01,332	(-)30,668(23)
2020-21	1,95,986	5,87,958	2,02,238	1,53,477	(-)48,761(24)
Total		**24,51,693**	**5,52,238**	**4,80,716 (87 *per cent*)**	

Source: Information supplied by the Department.

The targets of water quality tests in the State were achieved during 2016-18 while the shortfall in achievements of targets during 2018-19 and 2020-21 ranged between one and 24 *per cent*. The targets of tests fixed during 2016-21 were not commensurate with the quantum of the chemical and bacteriological tests required to be conducted as per NRDWP/JMM guidelines. The shortfall in targets set when compared to the requirement was 77.5 *per cent*. Thus, there was no assurance on quality of water being provided to the people.

The Chief Engineer cum Director In-charge (S&I) stated (March 2022) that targets have been fixed as per annual action plans. The fact remained that targets were not fixed as per guidelines.

(iv) Failure of bacteriological/ chemical tests and non-initiating of remedial action

Total coliform, faecal coliform, and *E.coli* are all indicators of drinking water contamination. These contaminations are harmful for health. Audit noticed that:

- In five (out of 20) divisions[2], in the results of 209 water quality samples (out of 71,804) tested (between May 2016 and February 2021), coliform was observed.
- In one (out of 20) test-checked division (Hamirpur), samples were collected from seven schemes by the Department and the same were found positive with coliform, E -Coli and excess iron as per details given in **Table 5.7**.

Table-5.7
Details of failed test samples (positive with coliform, E-Coli) in Hamirpur division

Sl. No.	Scheme	Date of sample	Name of test which failed	Date when the sample was found fit	Period when contaminated water was supplied.
1.	Bore No.-1 NIT Computer Centre	26 May 2016	E-Coli	Not repeated	Since 26 May 2016
2.	LWSS Tillu Jalari	16 October 2019	Coliform	22 October 2019	16 October 2019 to 21 October 2019
3.	LWSS Salghoon Ghatta	16 February 2016	E-coli	1 March 2016	16 February 2016 to 28 February 2016
4.	LWSS Salghoon Ghatta	15 September 2021	Coliform	21 September 2021	15 September 2021 to 20 September 2021
5.	LWSS Dhaneta	29 November 2019	E-Coli	Not repeated	Since 29 November 2019
6.	Hand Pump Rail Near GSSS School (Nadaun sub-division)	19 September 2018	Iron	Not repeated	Since 19 September 2018
7.	LWSS Bara Choru	26 February 2021	E-Coli	Not repeated	Since 26 February 2021

Out of seven schemes, the samples were repeated in respect of three schemes but neither any remedial action taken was seen on records, nor the samples were repeated in respect of remaining schemes. Besides, no action was taken to close the schemes. In such circumstances, possibility of water borne diseases could not be ruled out.

The EE, Hamirpur stated (December 2021) that verbal directions are issued to concerned persons (Keyman) for not supplying the water to consumers till the samples are tested fit. However, no records in support of retest and supervision of supply were produced to Audit.

(v) Fictitious reporting of tests conducted in District laboratories

In Kullu-1 division (out of 20 divisions), it was observed that 3833 number of water samples were tested during 2016-21 as per ledger, but in online reporting, 4598 number of water tests were reported for the same period pointing to possible fictitious excess reporting of 765 (20 *per cent*) tests.

(vi) Variations in water sample results between two laboratories of a scheme

There were two sub-divisional laboratories (Garnota and Banikhet) under the control of Dalhousie test-checked division. Scrutiny of results of joint inspection of a selected scheme (Augmentation of WSS to Village Jassure, Dukhar, Bharari and Tikkri) showed that a water sample of the scheme collected from the source and its results were received from both laboratories. In the results of tests received from both the laboratories, variations were observed as per details in **Table 5.8**.

[2] Baggi: 25, Chamba: 07, Kullu-1: 153, Mandi: 13 and Matiana: 11.

Table-5.8
Details of results of laboratories for same samples of a scheme

Sl. No.	Name of parameter	Required range as per Bureau of Indian Standards	Results of Garnota Laboratories	Result of Banikhet laboratories
1.	Turbidity	Up to five NTU	28.25 NTU (unfit)	18 NTU (unfit)
2.	Colour	5 to 15 HU	Normal	20 HU (unfit)
3.	Taste and Odour	Agreeable	Agreeable	Tasteless/odourless
4.	Total Dissolved Solid (TDS)	Upto 2000 mg/litre	16.13 mg/ litre (fit)	171 mg/litre (fit)
5.	Potential hydrogen (pH)	6.5 to 8.5	6.40 (unfit)	7.67 (fit)
6.	Total Hardness	Upto 600 mg/litre	18 mg/litre (fit)	153.33 mg/litre (fit)
7.	Conductance	1000	32.1mmho (fit)	342.2 (fit)
8.	Fluorides	1.0 to 1.5	0.2 (unfit)	Not available

The results showed that the water was unfit for consumption in three parameters. Further, variation in results of same sample in two laboratories cast doubt on the authenticity of water quality testing procedures. The EE Dalhousie assured (September 2021) action.

(vii) Verification of genuineness of samples

As per para 5.4.6 of Uniform Drinking Water Quality Monitoring Protocol, while taking samples from drinking water sources or consumers, the samplers should take the signatures of the operators, Gram Panchayat (GP) members or household members in the relevant register to verify the genuineness of the samples.

Audit noticed that in 10 (out of 20) test-checked divisions[3], 1,28,933 samples were taken (April 2016 to March 2021) for water quality testing. However, the sampler had not maintained any register for taking signatures of the operators, GP members or household members at any place so as to verify the sources/ taps from where these were taken. In the absence of such registers, the genuineness of the samples collected could not be verified in Audit.

The EEs concerned assured (October 2021 to March 2022) for compliance in future.

(viii) Non-referring of failed samples to district/ sub-divisional water quality testing laboratory

Para 5.1.1 of Uniform Drinking Water Quality Monitoring Protocol provides multi-Parameter of Water Quality through FTKs for Physio-chemical analysis. The water quality monitoring will be undertaken by the Department through laboratory tests and water quality surveillance will be undertaken by community through FTKs. All positively tested samples using FTKs (with certain probability of contamination) shall be referred to the nearest district/ sub-divisional water quality testing laboratory for confirmation.

Audit noticed that 67 water samples from various sources in four blocks of *Jal Shakti* Division Bilaspur were tested between October 2017 and October 2019 by Block Resource

[3] Baggi: 13,366, Bhoranj: 506, Chamba 17,614, Dalhousie: 16,529, Dharamshala: 9,424, Hamirpur: 14,432, Kaza: 6,527, Mandi: 27,832, Palampur: 8,055 and Thural: 14,648.

Centres (BRCs) through FTKs and found positive as per norms of Uniform Drinking Water Quality Monitoring Protocol. Following deficiencies were noticed:

- Reporting of failed samples was not made to *Jal Shakti Vibhag*.
- In nine samples pH value was ranging between two and six (permissible limit 6.5 to 8.5) which was highly acidic in nature and could cause health disorders.
- In 29 samples, the value of iron was found at 10 mg/litre which was much higher than permissible limit (0.3 to 1 mg /litre) and could cause health disorders such as diabetes, stomach problems, nausea, etc.
- In 54 samples, bacteriological, chloride, nitrate, fluoride tests were not performed.
- All adversely reported samples were not referred to the nearest district/ sub-divisional water quality testing laboratories for cross verification.

The EEs concerned assured (October 2021) that directions would be issued to the field staff for compliance of the instructions in future.

(ix) Field Test Kits

As per NRDWP/ JJM guidelines, water quality surveillance activities also include use of FTKs at Gram Panchayat (GP)/ Panchayati Raj Institutions (PRIs) level to know the extent of contamination.

Audit noticed:

- **Tests conducted through FTKs**

Details of targets of testing of water sources in nine DWSM using FTKs are given in **Table 5.9**.

Table-5.9
Details of water testing through field test kits in selected DWSM during 2016-21

(Tests in numbers)

Year	Total number of sources	Targets of tests	Tests conducted	Shortfall (*per cent*)
2016-17	1,06,243	3,18,729	63,178	2,55,551 (80)
2017-18	1,06,714	3,20,142	72,878	2,47,264 (77)
2018-19	1,07,011	3,21,033	76,381	2,44,652 (76)
2019-20	1,07,848	3,23,544	89,720	2,33,824 (72)
2020-21	1,11,513	3,34,539	88,218	2,46,321 (74)
Total		**16,17,987**	**3,90,375**	**12,27,612 (76)**

Source: Information supplied by Department.

Shortfall in water quality tests through FTKs ranged between 72 and 80 *per cent* which indicated that the Department had not ensured that the required numbers of tests of the sources were conducted as envisaged in the targets.

- **Issue of expired field test kits**

➢ In Keylong division, the EE-cum-Member Secretary had purchased 20 FTKs and 21 refills during March 2017 and March 2019 and distributed the same to the Junior Engineers and Gram Panchayats in the district between December 2018 and September 2020 after its expiry. Thus, expenditure incurred on purchase of FTKs and refills proved wasteful to that extent.

- In Kaza division, 30 FTKs received in April 2017 from DWSM Keylong were distributed to Junior Engineers[4] during October 2018 after date of their expiry.

The EE, Keylong division stated (August 2021) that the FTKs could not be distributed due to shortage of staff. The EE, Kaza division did not furnish reasons for non-conducting of test through FTKs.

(x) Water tests not conducted through Chloroscopes

As per Departmental instructions (August 2008), at least two samples should be taken from each scheme every month in order to test the quantity of chlorine in the water through chloroscopes. The results of such tests are required to be sent to the Superintending Engineer (Planning and Investigation).

Audit noticed that in four (out of 20) test-checked divisions[5], the EEs concerned had purchased (March 2016 to March 2021) 976 chloroscopes of ₹ 16.85 lakh and distributed (March 2016 to March 2021) to sub-divisions. However, no test to measure the quantity of chlorine in water was conducted by the sub-divisions through these chloroscopes and providing safe drinking water to households could not be assured. Besides, the chloroscopes were lying unused/ idle in the sub-divisions.

The EEs concerned stated (September 2021 to January 2022) that no tests were conducted through chloroscopes and instructions shall be adhered to strictly. The replies did not explain reasons for non-conducting of test through the chloroscopes.

(xi) Issue of bleaching powder after expiry of its best use life

Bleaching powder is used in the process of disinfection of water and this chemical is also known as disinfectant which means the chemical which kills bacteria. Further, as per instructions issued (March 2016) by the Engineer-in-Chief, JSV, bleaching powder must be consumed within three months from the date of manufacturing so that its strength is not reduced.

Audit noticed in 11 (out of 20) divisions[6] that 92,849 kg bleaching powder valuing ₹ 22.83 lakh received by the divisions between September 2016 and February 2021 was issued between February 2017 and December 2021 to various water supply schemes with a delay of one to 27 months after three months from the date of receipt (although manufacturing date was not available) of bleaching powder which indicated that the bleaching powder was issued after expiry of the best use life of three months in contravention of the instructions *ibid*. Thus, drinking water was supplied to households without proper chlorination as bleaching powder's strength as disinfectant reduces after three months.

The Department assured (December 2022) for review of the matter.

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4 Kaza, Kee, Lossar, Sumling and Tabo.

5 Bilaspur: 630 (₹ 11.97 lakh); Jhandutta: 200 (₹ 3.80 lakh); Kullu-1: 110 (₹ 0.81 lakh); and Mandi: 36 (₹ 0.27 lakh).

6 Bhoranj: 3,500 kg; Chamba: 4,113 kg; Chauntra: 4,850 kg; Dalhousie: 7,800 kg; Dharamshala: 32,550 kg, Hamirpur: 21,124 kg, Keylong: 1,100 kg, Kullu-1: 8,540 kg, Mandi: 3,554 kg, Matiana: 3,500 kg. and Salooni: 2,218 kg.

5.4 Water Borne Diseases reported in the State

Audit noticed that due to quality problem in the water, various water borne diseases (acute diarrhea/ gastroenteritis, viral hepatitis, etc.) were reported in the state as per details given in **Table 5.10**.

Table-5.10
Details of prevalence of water borne diseases in the State during 2016-21

(In numbers)

Year	Acute Diarrhea/ gastroenteritis and dysentery	Viral hepatitis (jaundice)	Enteric fever (typhoid)	Total
2016	222596	3073	14403	240072
2017	250636	683	14952	266271
2018	227317	471	16017	243805
2019	260644	532	14206	275382
2020	159009	272	7692	166973
2021	96874	136	5237	102247
Total	**1217076**	**5167**	**72507**	**1294750**

Source: Information supplied by Deputy Mission Director, National Health Mission.

During the period covered under PA, 12,94,750 instances of water borne diseases were reported in the State which indicates that the quality of water being supplied through the drinking water schemes was not appropriate.

B - Manpower Management

Manpower is one of the essential elements of an organization. Without sufficient manpower, the optimal output cannot be achieved.

Overall, 879 technical posts and 2,903 non-technical posts were lying vacant in test-checked divisions as on 31 March 2021. In 20 laboratories of 20 test-checked divisions, against the suggested 160 posts in district level and sub-divisional level laboratories, only 42 persons (26 *per cent*) were engaged.

5.5 Overall staff sanctioned and persons in position

The overall position of staff sanctioned and persons-in-position in the State/ test-checked divisions as of March 2021 is given in **Table 5.11**.

Table-5.11
Position of sanctioned strength and persons-in-position as of March 2021

Category	Sanctioned strength	Persons-in-position	Vacancy (*per cent*)
Overall position in the State			
Technical	6,699	5,089	1,610 (24)
Non-Technical	17,046	15,138	1,908 (11)
Position of test-checked divisions			
Technical	2,472	1,593	879 (36)
Non-Technical	7,513	4,610	2,903 (39)

Source: Information supplied by Department.

Shortage of staff in the Department would have negative impact on efficient execution of water supply schemes/ works.

- **Availability of staff in Laboratories**

Uniform Drinking Water Quality Monitoring Protocol (UDWQMP) (February 2013) issued by Ministry of Drinking Water and Sanitation, GoI prescribed a list of staff required for various levels of laboratories.

Audit observed that:

- In 20 water quality testing laboratories in 20 test-checked divisions, against 160 posts in district level laboratories (DLLs) and sub-divisional level laboratories (SDLLs), 42 personnel (26 *per cent*) were engaged as of March 2021 as per details in **Appendix-5** and position of availability of staff in the laboratories in brief is given in **Table 5.12**.

Table-5.12
Details of staff available in the Laboratories *vis-à-vis* staff suggested under UDWQMP

Type of the Laboratories	Number of staff suggested as per UDWQMP	Number of staff available (Contract/ outsourced)	Shortage (Percentage)
District Level Laboratories	64	17(05)	47 (73)
Sub-Divisional Level Laboratories	96	25(06)	71 (74)

- The UDWQMP further suggested that each laboratory should have at least one regular post of water analyst/ chemist. Audit observed that in six laboratories, the Department had engaged six regular posts of Assistant Chemist while in 11 laboratories, no Assistant Chemist have been engaged on regular basis. The work of chemist was being discharged by 11 contract/ outsourced personnel. Moreover, in three laboratories, no Assistant Chemist was posted, and laboratories were being operated by the laboratory Assistants.

Shortage of staff adversely impacted the achievement of targets fixed by the Department for testing the required number of water samples.

During the exit conference, the Department stated (December 2022) that efforts would be made for deployment of adequate manpower.

5.6 Support activities- Capacity building

As per NRDWP/ JJM guidelines, the funds for support activities are to be utilised for providing support for awareness, creation and training activities taken up by the communication and capacity development units (CCDU) under the Water and Sanitation Support Organisation (WSSO), setting up of district and sub-divisional water quality testing laboratories, supply of field test kits and training to grass root level workers for water quality tests and providing hardware and software support for MIS at the district and sub-divisional level to bring in more accountability, effective monitoring and transparency in delivery of services.

Activity-wise targets and achievements

The component-wise details of targets and achievements under support activities for 2016-21 are given in **Table 5.13**.

Table-5.13
Component-wise details of targets fixed and achievements under support activities for 2016-21

(In numbers)

Year	Targets			Achievement		
	IEC activities[7]	HRD (training)	Computer trainings	IEC activities	HRD	Computer
2016-17	27,438	4,214	20	13,554 (49)	3,606 (86)	0
2017-18	27,226	9,733	20	17,802 (65)	6,182 (64)	0
2018-19	26,925	9,733	20	4,015 (15)	8,967 (92)	23
2019-20	13,835	6,473	22	1,10,036 (795)	4,605 (71)	2
2020-21	45,053	17,937	5	4,55,954 (1012)	5,722 (32)	0
Total	**1,40,477**	**48,090**	**87**	**6,01,361**	**29,082**	**25**

Source: Information supplied by the WSSO.
IEC: Information, education and communication, HRD: Human resource development.

It would be seen from above table that:

- During 2019-21, the overall achievement under IEC was higher than the targets fixed. However, there was shortfall in achievements of targets under IEC during 2016-19 (2016-17: 51 *per cent*; 2017-18: 35 *per cent;* and 2018-19: 85 *per cent*).
- Shortfall in achievements of the targets under HRD (training) during 2016-21 ranged between eight and 68 *per cent*.

C - Internal Controls and Monitoring

The Department had not set up Vigilance and Monitoring Committees (VMCs) at State/ District/ Village levels to monitor progress and exercise vigilance in respect of water supply schemes. Department had also not constituted the review committee for major works costing ₹ five crore and above in the state which indicated that the major works were not reviewed by the committee at apex level. Percentage shortfall in conducting inspections of works of water supply schemes during 2016-21 by SEs ranged between 89 and 97 while that of EEs ranged between 90 and 97. The mechanism of social audit had not been put in place by the Department to ensure transparency in execution as well as spending on the water supply schemes.

5.7 Monitoring

5.7.1 The guidelines of NRDWP provide that vigilance and monitoring committees (VMCs) at State/District/ Village levels were required to be set up to monitor the progress and exercise vigilance in respect of water supply schemes.

The Department, however, had not set up the VMC at State/ district/ village levels during 2016-21. In the absence of the VMC, the implementation of the water supply schemes was not monitored periodically leading to many schemes lagging behind their scheduled date of completion.

5.7.2 Rule 90 of Himachal Pradesh Financial Rules 2009 provides for constitution of a review committee consisting of the executing agency, the Head of the Department and a

[7] Information, Education and Communication activities like water quality monitoring, training of NGOs, audio-visual publicity, hoardings and wall writings, slogans, picture frames, group meetings, etc.

representative each from the Administrative Department and the Finance Department to review the progress of the works costing five crore rupees and above.

Audit noticed that the Department had not constituted the review committee for major works costing ₹ 5.00 crore and above in the State as of May 2022. Resultantly, in 14 (out of 20) test-checked divisions[8], out of 58 schemes each having an approved cost above ₹ five crore or more (approved for ₹ 992.22 crore during 2016-21), three schemes were completed in which there was a delay of 22 months in one scheme, one scheme was held up, 16 schemes had not started and 38 schemes were in progress in which, there were delays ranging from four to 26 months.

5.7.3 Chapter 6 of Operational Guidelines of JJM provides that for all works executed under the Mission, third party inspection and certification before payment was mandatory to gain assurance of execution of quality work.

Audit noticed in 15 test-checked divisions[9] that payment of ₹ 34.75 crore was made (January 2020-September 2021) to the contractors concerned for the execution of 531 sub-works without inspection and certification by the third party as required under the provision of guidelines of JJM *ibid*. In the absence of inspections of works by the third party before releasing payments as envisaged, the authenticity and quality of execution of works could not be verified in Audit.

5.7.4 As per directions (June 2006) issued by the E-in-C, SE was to conduct one inspection of works per division in a month and EE was to conduct 10 inspections per month in the division. Further, as per instructions issued (May 2017) by the E-in-C, a register for inspection/ monitoring of water supply schemes was to be maintained by the field offices and action taken report in this regard was to be submitted to E-in-C on monthly basis.

Audit noticed that against the required inspections by the SEs and EEs of the test-checked divisions there was shortfall of 12,549 inspections (SEs: 1,119 and EEs: 11,430) out of required 13,200 inspections during 2016-21. The works therefore were not adequately supervised.

During exit conference, the Secretary stated (December 2022) that sufficient mechanism is available for checks and balances at all levels, but efforts would be made to strengthen their role.

5.8 Social Audit

As per the programme guidelines, social audit is to be conducted by the community-based organizations (VWSC/ User groups) after every six months to ensure that the works undertaken are as per specification and to provide feedback according to the locally

[8] Baggi: two schemes (₹ 20.61 crore); Bilaspur: six schemes (₹ 146.41 crore); Bhoranj: two schemes (₹ 57.80 crore); Chauntra: two schemes (₹ 46.30 crore); Dharamshala: five schemes (₹ 60.89 crore); Hamirpur: two schemes (₹ 23.66 crore), Jhandutta: six schemes (₹ 143.98 crore), Kullu-1: five schemes (₹ 67.17 crore), Mandi: seven schemes (₹ 85.79 crore), Matiana: one scheme (₹ 7.91 crore), Palampur: seven schemes; (₹ 110.88 crore), Salooni: two schemes (₹ 50.35 crore), Shimla: three schemes (₹ 57.45 crore) and Thural: eight schemes (₹ 113.02 crore).

[9] Baggi, Bhoranj, Bilaspur, Chamba, Chountra, Dalhousie, Hamirpur, Jhandutta, Keylong, Kullu-1, Mandi, Matiana, Rampur, Reckong Peo and Salooni.

developed yardsticks for monitoring as well as key indicators for measuring consumer's satisfaction.

Audit noticed that in all the 20 test-checked divisions, the mechanism of social audit had not been put in place by the Department to ensure transparency in execution as well as spending on the water supply schemes.

During exit conference, the Secretary admitted the facts and assured (December 2022) that the possibility of conducting social audit would be ensured in future.

5.9 Complaints of water in selected divisions

Details of complaints relating to water supply in 12 (out of 20) test-checked divisions during 2016-21 are given in **Table 5.14**.

Table-5.14
Details of complaints relating to water supply in 12 (out of 20) test- checked divisions
(In numbers)

Year	Complaints received	Complaints disposed off during April 2016 to March 2021	Complaints outstanding on 31 March
2016-17	2657	1701	956
2017-18	2914	1683	1231
2018-19	2581	1703	878
2019-20	3946	2993	953
2020-21	6051	4583	1468

Source: Information supplied by the Department.

It can be seen from above table that large numbers of water supply complaints were outstanding during 2016-21. Besides, the divisions concerned had not maintained proper records of the complaints to show the dates of settlement of each complaint, action taken in brief, etc.

The EEs concerned stated (July 2021 to February 2022) that complaints were disposed off as and when received but not shown disposed off in the complaint registers. The fact, however, remained that the divisions had not shown any records in support of disposal of the pending complaints in the relevant registers.

Conclusion

The water quality monitoring and surveillance mechanism was not functioning effectively to ensure availability of clean and safe drinking water to the population at all times. The laboratories were not equipped with the recommended equipment, thereby putting the reliability of even those water quality tests conducted under doubt. The Department had not set up its own State Level Water Testing Laboratory. The mandatory NABL accreditation of all district and sub-divisional water quality testing laboratories was not ensured which were understaffed which adversely impacted their performance.

The monitoring of the schemes was poor as the institutional mechanism for monitoring and internal control through various committees was non-functional and community participation through social audit was a non-starter.

Recommendations

The Government may consider:

(i) *Setting up and operationalising State level water quality testing laboratory and ensure to review of required percentage of samples tested in the district laboratories.*

(ii) *Upgrading and ensuring accreditation of all laboratories from National Accreditation Board for Testing and Calibration Laboratories to gain assurance of availability of standard water quality for citizens.*

(iii) *Engaging adequate and qualified staff for the laboratories.*

(iv) *Strengthening internal control mechanism by setting up of vigilance and monitoring committees to monitor progress and exercise vigilance in respect of water supply schemes.*

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Himachal Pradesh

Shimla
Dated: 22 March 2023

Countersigned

(GIRISH CHANDRA MURMU)
Comptroller and Auditor General of India

New Delhi
Dated: 24 March 2023