CHAPTER-II

PERFORMANCE AUDIT

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This chapter contains findings of Performance Audit on "Implementation of Rural Drinking Water Supply Programme in Gujarat".

PERFORMANCE AUDIT

NARMADA, WATER RESOURCES, WATER SUPPLY AND KALPASAR DEPARTMENT

2.1 Implementation of Rural Drinking Water Supply Programme in Gujarat

Executive Summary

Water is a State subject and the State Government is responsible to ensure access to a minimum quantity of potable water. Government of India (GoI) supplements the efforts of the State Governments with technical and financial assistance for provision of safe drinking water to the habitations in the rural areas of the country. The Water Supply Department (WSD) is responsible for the proper implementation of Rural Water Supply Programme (RWSP) through Gujarat Water Supply and Sewerage Board (GWSSB) and Water and Sanitation Management Organisation (WASMO).

A Performance Audit of Rural Drinking Water Supply Programme in Gujarat was conducted between March 2018 and August 2018 covering the period 2013-18. The main audit findings are summarized below:

- ***As of August 2018, out of 17,843 villages in the State, 8,947 villages had been covered under Narmada Canal based projects/programmes and 3,893 villages under other source based water supply projects.***
- ***Government of Gujarat's (GoG) claim that all 35,996 habitations in the State were fully covered with water supply was not correct.***
- ***Out of 2,352 villages covered under 91 Rural Water Supply Schemes (RWSSs) in eight test-checked Districts, only 1,587 villages were getting water through RWSSs. Of the remaining 765 villages, 258 villages had no access of water due to insufficient water at source, non-creation of internal distribution networks, damaged pipes, etc.***
- ***There were under-reporting of non-functional WSSs. Even many of the non-functional schemes were not in the knowledge of the Department.***
- ***State Level Laboratory (SLL) at Gujarat Jalseva Training Institute (GJTI) conducted only routine tests instead of conducting specific tests and could not act as a referral laboratory due to non-availability of high end equipment/instruments. Due to less number of Taluka Level Laboratories (TLLs), there was vast shortfall in the number of water sources to be tested as per norms. Mobile Laboratory Vans were not being utilised optimally. Field Test Kits meant for water quality testing were not utilized by Gram Panchayats (GPs) and Multi Purpose Health Workers (MPHWs) in test-checked habitations.***
- ***GoG's claim of no Quality Affected habitations in the State was not correct. About 10 per cent habitations in the State had no fit source of potable water.***

- ***In the test-checked Districts, bacteriological testing was not being done for all sources of water except for water supplied from RWSS, which is supplied after treatment in Water Treatment Plants (WTPs).***
- ***Irregular booking of expenditure under Research and Development (R&D) schemes by GWSSB and the test-checked Districts respectively, non-surrender/non-refund of unspent funds by WASMO, and non-payment of water charges by Gram Panchayats were noticed in Audit.***
- ***Periodical monitoring of completed schemes was not being done.***

2.1.1 Introduction

Water is a State subject and the State Government is responsible to ensure access to a minimum quantity of potable water. Gujarat has 185 river basins and the available quota of water in the State is 55,608 million cubic metres[1].

As of August 2018, the State has 17,843 villages, of which drinking water was being supplied to about 12,840 villages (72 *per cent*) through water supply schemes implemented by Government of Gujarat (GoG). Of these 12,840 villages, 8,947 villages (70 *per cent*) have been covered under Narmada Canal Based Projects/Programmes and 3,893 villages (30 *per cent*) have been covered under other source[2] based water supply projects.

According to the data available on the Integrated Management Information System[3] (IMIS), as on 01st April 2018, 91.11 *per cent* habitations of Gujarat had the facility of Piped Water Supply (PWS) against the all India percentage of 41.91.

Government of India (GoI) launched (April 2009) the National Rural Drinking Water Programme[4] (NRDWP) for providing grants to State Governments for implementation of Rural Water Supply Schemes (RWSSs) with special focus on water-stressed and water quality affected areas. NRDWP prioritises coverage of uncovered/partially covered/slipped back/water quality affected habitations[5] to make them fully covered habitations[6] by carrying out various water supply related works, recharging of ground water, establishing water testing laboratories for quality control purposes, *etc.*

As per the NRDWP guidelines, GoG had prepared (February 2015) a 'Draft Water Policy 2015' based on the 'National Policy Framework'. However, the policy was not yet finalized (May 2019).

In addition to NRDWP, GoG also implemented State sponsored Water Supply Schemes (WSSs) like Rural Water Supply Programme (RWSP), Scheme for

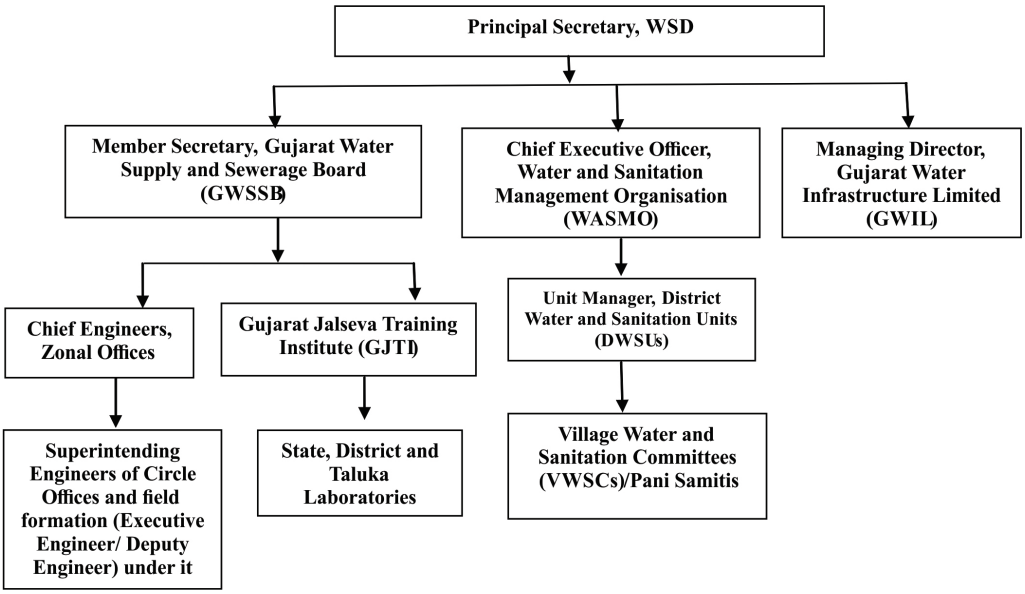
1 Surface water: 38,100 million cubic metres and Underground water resources: 17,508 million cubic metres
2 Dams, Rivers, Irrigation Canals, Underground water, *etc.*
3 A web-based platform launched by Ministry of Drinking Water and Sanitation (MoDWS) to enable online monitoring of the status of water supply projects and coverage across rural India. It consists of data relating to habitation, scheme implementation, water source and quality of water.
4 Successor of Accelerated Rural Water Supply Programme.
5 **Uncovered habitation** is one which has never been provided with drinking water supply or supplied with less than 10 litre per capita per day (lpcd) by the Government; **Partially covered habitation** is one in which the average supply of drinking water is equal to or less than 40 lpcd but more than 10 lpcd; **Slipped back habitation** is one which had the status 'Fully Covered' at one point of time but presently is 'Partially Covered'; **Quality Affected Habitation** is one where water samples tested in laboratories have indicated levels of chemical contamination (limited to Arsenic, Fluoride, Iron, Nitrate and Salinity) higher than the permissible limits set by the Bureau of Indian Standards.
6 **Fully covered habitation** is one in which the average supply of drinking water is equal to or more than 40 lpcd. within a distance of 100 meters from the household.

Water Conservation and Prevention of Wastage of Water, Mukhya Mantri Mahila Pani Samiti Protsahan Yojana, *etc.* during 2013-18.

2.1.2 Organisational set-up

The Water Supply Department (WSD) is responsible for implementation of rural drinking water supply programmes in the State. **Chart 1** shows the organisational set-up of the WSD and a brief of the functioning of the agencies under it involved in the implementation of various programmes:

Chart-1



(i) GWSSB gets the raw water from the bulk pipeline and executes the work of the group distribution schemes to provide potable water upto the underground sump of villages. It implements the Regional Water Supply Schemes (RWSSs), Individual Water Supply Schemes (IVWSSs), Mini Piped Water Supply Schemes and Hand Pump Schemes. Gujarat Jalseva Training Institute (GJTI) and its water testing laboratories at District and Taluka levels are also under the control of GWSSB.

(ii) WASMO provides water supply by way of stand post and household connections by laying distribution pipeline under 'In-village Water Supply Schemes' and 'Mini Piped Water Supply Schemes'. WASMO also plans and oversees the execution of this activity by formation of Pani Samitis through people's participation.

(iii) GWIL lays and maintains the bulk pipeline for transmission of Inter District Narmada Canal Water in bulk.

2.1.3 Audit Objectives

The broad objectives of the Performance Audit were to ascertain whether -

- there was proper planning to achieve the goals set by GoI/GoG and to provide sufficient coverage and availability of drinking water at the habitation level;

- the implementation of schemes and utilisation of funds was effective and efficient; and
- necessary institutional mechanism existed for effective implementation and monitoring of various rural drinking water supply schemes.

2.1.4 Audit Criteria

The main sources of Audit criteria applied for the Performance Audit were -

- Strategic plans, notifications, orders and circulars issued by the MoDWS, GoI;
- Guidelines for NRDWP issued by GoI;
- Guidelines/Manuals/Orders issued by GoG relating to implementation of rural drinking water supply schemes; and
- Gujarat Financial Rules, Gujarat Public Works Manual, Manuals published by the Central Public Health and Environmental Engineering Organisation (CPHEEO) of Ministry of Urban Development on water supply and treatment and Operation and Maintenance of Water Supply Schemes.

2.1.5 Audit scope and methodology

The Performance Audit covered activities undertaken by the WSD during the period 2013-18 for the implementation of various Rural Drinking Water Supply Programmes including NRDWP. The Audit was conducted between February 2018 and August 2018.

Audit commenced with an entry conference (February 2018) with the Principal Secretary of WSD wherein the audit objectives, audit criteria, scope and methodology of audit were discussed and the inputs of the Department were obtained. Audit examined the records covering the period 2013-18 at WSD, GWSSB, GWIL, WASMO, GJTI and their field offices in test-checked Districts. Audit selected eight Districts[7] out of 33 Districts in the State for detailed test-check by adopting Simple Random Sampling without Replacement (SRSWOR) method. Audit, alongwith officials of GWSSB and/or WASMO conducted joint physical verification of assets created for water supply and beneficiary survey of 78 habitations in the Districts selected for test-check in Audit. Details of the statistical frame work and selection are given in **Appendix-IV and V**.

An exit conference was held (30 May 2019) with the Principal Secretary, WSD to discuss the audit findings. The views of the State Government have been considered and incorporated in the report.

Audit Findings

2.1.6 Planning and Organisation

2.1.6.1 Planning

- ***Long term planning***

The GoG prepared (May 2013) a Narmada Master Plan for creation of State Wide Water Supply Grid as a long term strategy for drought proofing of the

7 (i) Bharuch, (ii) Dahod, (iii) Dang, (iv) Jamnagar, (v) Patan, (vi) Porbandar, (vii) Sabarkantha and (viii) Valsad

water supply sector and with the objective to supply drinking water to almost 75 *per cent* population of the State[8] by 2021. The master plan identified that the State had 18,066 villages and 242 towns as of May 2013. The GoG planned to implement 387 projects under the Grid to be completed by 2021. Of these, 174 projects covering 9,633 villages and 131 towns of Narmada Master Plan were being implemented under Sardar Sarovar Canal Based Water Supply Project programme and Sujalam Sufalam Yojana. The remaining 213 projects covering 5,318 villages and 15 towns based on surface/sub-surface sources were being implemented under the RWSP. As of August 2018, out of 17,843 villages[9] in the State, 8,947 villages have been covered under Narmada Canal based projects/ programmes and 3,893 villages have been covered under other source based water supply projects.

The Principal Secretary in the exit conference (30 May 2019) stated that preparation of a new plan for replacing ground water with surface water and to cover all the villages of the State through piped water supply is under consideration.

- ***Short term planning***

As per NRDWP guidelines, Water Security Plans (WSPs) are required to be prepared at the Village, District and State levels to optimise the use of water resources to meet basic needs and also for taking decisions with regard to water resources management including investment. The District WSP is prepared based on the WSPs of the villages in the District, which in turn is used to prepare the State WSP. The WSP comprises of details such as demography, physical features, water sources, available drinking water infrastructure, availability of funds, funds required for RWSP, *etc.*

Audit observed that the WSP was prepared only for the villages where the rural drinking WSS was to be undertaken by WASMO. However, test-checked Districts had not prepared the WSP but GoG had prepared the State WSP for the period 2012-17 in respect of drinking water supply sector. However, such plan was not prepared thereafter. The State WSP was prepared without obtaining the WSPs of the Districts/Villages, which consists of core level planning.

NRDWP guidelines also required each State to prepare their Annual Action Plan (AAP) detailing activities in the rural drinking water sector proposed to be taken up during the year and the financial costs of such proposals. AAP, *inter alia*, includes broad directions/thrust and tangible targets planned to be achieved in the financial year.

Audit observed that the GoG was regular in submitting the AAP to the GoI in all the years under review. However, it was also observed that during preparation of AAP, convergence of various WSSs was not considered. There was no provision in the State to meet the labour cost of recharging systems/surface water impounding structures, de-silting of ponds under sustainability component from Mahatma Gandhi National Rural Employment Guarantee Scheme/Integrated

8 The population of the State as per Census 2011 is 6.04 crore but the master plan considered the population of the State as 5.06 crore as per Census 2001

9 223 villages are not in existence as they might have been merged with towns on their expansion.

Watershed Management Programme funds. Further, no baseline survey had been conducted to check the availability of potable water to habitations/households, to access and locate the sources/delivery points of water in use for drinking and cooking purposes, to identify new sources, *etc.*, which was required for effective planning.

The Principal Secretary in the exit conference (30 May 2019) stated that henceforth efforts would be made for convergence while preparing the AAP. In respect of baseline survey, it was stated that the next AAP for 2020-21 is being prepared by covering multiple water sources so that no village would depend on a single water source.

2.1.6.2 Coverage of habitations

As per NRDWP guidelines, coverage depends on percentage of people within habitation getting basic minimum quantity of potable water within the prescribed distance of the household, from either a public or community source. The NRDWP guidelines envisaged that by 2017, at least 50 *per cent* of rural population have access to 55 lpcd potable water within their household premises or within 100 meter radius.

GoG claimed that as on 01 April 2018, all the 35,996 habitations in the State were fully covered. As per the information furnished to Audit by the District Water and Sanitation Units (DWSUs) of the test-checked Districts, 41 (53 *per cent*) out of 78 test-checked habitations had been fully covered and the remaining 37 habitations were partially covered.

The Principal Secretary in the exit conference (30 May 2019) stated that necessary steps would be taken for covering the habitations fully.

2.1.6.3 Households with Piped Water Supply (PWS)

The Strategic Plan (2011-22) prepared by MoDWS envisaged to provide PWS to at least 50 *per cent* of rural households by 2017. GoG claimed (July 2018) through IMIS that out of 35,996 habitations in the State, 33,044 habitations (92 *per cent*) had PWS. As per information furnished by the DWSU of the test-checked Districts in respect of status of PWS facility in 78 test-checked habitations, 64 habitations (82 *per cent*) were having facility of PWS. However, during joint physical verification (April 2018 to August 2018) of assets in these 64 habitations, it was observed that the facility was defunct in 32 habitations as on the date of physical verification.

The Principal Secretary in the exit conference (30 May 2019) stated that identification of non-functional/defunct schemes is in progress and remedial action for reviving the scheme would be taken.

2.1.7 Implementation of schemes

As claimed by GoG, the State had already achieved the targets to be achieved by the year 2017 *viz.* ensuring at least 50 *per cent* of rural households are provided with PWS, at least 35 *per cent* of rural households have PWS with household

connection, less than 20 *per cent* use public taps and less than 45 *per cent* use hand pumps or other safe and adequate private water sources, *etc.*

2.1.7.1 Implementation of Regional Water Supply Schemes

Drinking water is being supplied to about 12,840 (71.96 *per cent*) out of 17,843 villages in the State through 347 RWSSs.

- ***Non-supply of water through Regional Water Supply Schemes***

As per the District profile maintained by the test-checked eight Districts, as on 31 March 2018, out of 3,727 villages, 2,352 villages[10] (63 *per cent*) were covered under 91 RWSSs while remaining 1,375 villages (37 *per cent*) were dependant on other source of water. Of these 2,352 villages, 1,587 villages[11] (67.47 *per cent*) were getting water through RWSSs. Of the remaining 765 villages, 258 villages[12] had no access to RWSSs water due to low water pressure at the tail end villages under the schemes, damaged pipes of the supply networks, non-creation of internal distribution networks in the villages and insufficient quantity of water at the sources. Other 507 villages were not drawing water from the RWSSs because the Gram Panchayats (GPs) did not want to pay the water charges. Unwillingness to use water through RWSS indicates that the Information, Education and Communication (IEC) activities undertaken by the authorities (WASMO and GWSSB) were ineffective as they failed to persuade the habitants of these villages/GPs to use treated potable water available through RWSS.

During joint physical verification (April 2018 to August 2018) of assets in 78 test-checked habitations, Audit observed that 37 habitations[13] were covered under different RWSSs. Out of these, 18 habitations[14] were getting water through RWSSs while 16 habitations[15] were not getting water through RWSS due to non-supply of water and non-connectivity of RWSS with village sumps/Elevated Storage Reservoirs (ESRs). Therefore, these habitations were using ground water, the quality of which was not tested and assured. Remaining three habitations[16] were unwilling to take water supplied through RWSS. It was also observed that Devla habitation of Bharuch District was getting water from RWSS, however, the supply of water was done at an interval of 15 to 20 days due to insufficient water at source. Similarly, although Ranjitpar habitation of Jamnagar District was covered under RWSS, the households did not get water due to low height of the cistern[17].

The EE of concerned division of GWSSB stated (May 2018 to July 2018) that efforts would be made in the current AAP, to provide water to the villages not getting the same due to various technical reasons.

10 Bharuch - 363, Dahod - 158, Dang - 145, Jamnagar - 430, Patan - 516, Porbandar - 146, Sabarkantha – 467 and Valsad - 127
11 Bharuch - 220, Dahod - 117, Dang - 143, Jamnagar - 300, Patan - 402, Porbandar - 98, Sabarkantha – 190 and Valsad - 117
12 Bharuch - 85, Dahod - 37, Dang - 2, Jamnagar - 23, Patan - 49, Porbandar - 18, Sabarkantha – 38 and Valsad - 6
13 Bharuch - 6 out of 7, Dahod - 0 out of 14, Dang - 8 out of 11, Jamnagar - 5 out of 5, Patan - 6 out of 9, Porbandar - 4 out of 4, Sabarkantha - 4 out of 12 and Valsad - 4 out of 16
14 Bharuch - 1, Dang - 1, Jamnagar - 3, Patan - 6, Porbandar - 4, Sabarkantha - 2 and Valsad - 1
15 Bharuch - 4, Dang - 7, Jamnagar - 2 and Valsad - 3
16 Bharuch-1 and Sabarkantha-2
17 A tank/reservoir for storage of water constructed for supplying water to hilly areas

The Principal Secretary in the exit conference (30 May 2019) stated that technical problems leading to interruption in water supply through RWSS would be addressed.

In addition to the above, during the course of test-check, Audit also observed that:-

(i) RWSS (Rundh Rajpardi, Bharuch) started (December 2010) with the tendered cost of ₹ 30.48 crore for covering 70 villages of the Jhagadia Taluka was stipulated to be completed by November 2014. However, it was observed that even after an expenditure of ₹ 27.68 crore, the work was still in progress (June 2018), as an intake well constructed for ₹ 1.25 crore under the scheme, got tilted (October 2013) beyond the permissible limit due to faulty design and was found unfit for future use.

The Principal Secretary in the exit conference (30 May 2019) stated that efforts are being made and the project would be completed within two months. Audit observed that the project was still not complete (September 2019).

(ii) Narmada No-Source RWSS, Part II was approved (May 2010) under NRDWP to provide potable water to the habitants of fluoride affected 12 villages of Narmada District. As per the tender condition and work order, the pipes for the work were to be procured by the contractor from the approved vendors of GWSSB. The work of supplying and laying of pipelines was completed in August 2014 at the cost of ₹ 3.73 crore. However, these pipes failed in field hydro-testing done between October 2013 and December 2013 and leakages appeared in pipes at various locations. Hence, hydro-testing of full stretch of pipelines could not be done. GWSSB instructed the contractor to replace all the pipelines laid; however, the same was not done. Finally, GWSSB terminated (June 2016) the contract and en-cashed performance guarantee (PG) of ₹ 23.49 lakh and also deducted liquidated damage (LD) of ₹ 3.27 lakh from the running account (RA) bills of the contractor. Audit observed that GWSSB had not taken any action to complete the work, as a result of which the objective of providing potable water to the villagers was defeated.

The Principal Secretary in the exit conference (30 May 2019) stated that necessary remedial action would be taken.

2.1.7.2 Implementation of other Water Supply Schemes

In Gujarat, in addition to RWSS, other WSSs *viz.* IVWSS, Mini Pipe WSSs, In-village WSSs and Hand Pump schemes are also implemented[18].

- ***Under reporting of non-functional Water Supply Schemes***

As per IMIS data for June 2018, GoG reported that 2,050 out of 93,794 WSSs in the State were non-functional. On comparison of the same with the physical records of test-checked Districts during the course of audit (April 2018 to August 2018), non/under-reporting of non-functional schemes in IMIS was

18 The above schemes are collectively called as Piped Water Supply (PWS) schemes (excluding the Hand Pump Scheme)

observed. As per records of DWSUs/Divisions of GWSSB of test-checked Districts, there were 377 non-functional schemes in these eight test-checked Districts. However, only 76 schemes (20 *per cent*) were reported as non-functional schemes in IMIS.

Similarly, Audit also observed that as on 31 March 2018, against 2,68,181 functional and 14,975 non-functional hand pumps in the State as per records of GWSSB, the figures reported in IMIS were only 5,785 functional and 86 non-functional hand pumps.

The DWSUs (WASMO) of test-checked Districts accepted the facts and assured that the same would be corrected in due course. GWSSB stated that the details of hand pumps were entered wrongly through oversight by the field offices in the IMIS. It was also assured that the data already entered would be corrected in consultation with the IMIS authority of GoI.

- ***In-village WSS/IVWSS***

As per records of eight test-checked Districts maintained by DWSUs/Divisions of GWSSB, there were 6,346 in-village WSSs/IVWSS[19] (March 2018). Out of these, 139 in-village WSS/IVWSSs[20] (2.19 *per cent*) were reported (April to August 2018) as non-functional. Further, as per records there were 49 in-village WSSs/IVWSS (April to August 2018) in the 78 test-checked habitations of the test-checked Districts and all were reported functional. However, during joint physical verification (April 2018 to August 2018) of assets in these 78 test-checked habitations, audit found 16 defunct in-village WSSs/IVWSSs (32.65 *per cent*) though as per records, these were reported as functional schemes.

The above audit observation is of a nature that may reflect in other Districts also, which were not covered in the test-check conducted during audit. The Department/Government may internally examine all such cases to ensure functioning of all in-village WSSs/IVWSSs.

Management of in-village WSSs was the responsibility of the concerned GPs/Pani Samitis with institutional and technical support of WASMO/GWSSB. However, no efforts were made by WASMO/ GWSSB, as neither the IEC activities were undertaken nor any technical guidance was provided to the GPs/Pani Samitis for operation and maintenance of these schemes.

Audit recommends that the State Government may identify non-functional water supply schemes and operationalise them.

- ***Mini Pipeline Schemes***

In Gujarat, most of the Scheduled Tribe populations are concentrated in hilly terrain and forests. The habitations in these areas are small and scattered across considerable distances. Owing to the undulating hilly terrain, it was difficult to implement the RWSS in these areas and hence execution of mini pipeline

19 Bharuch-843, Dahod-986, Dang-500, Jamnagar-756, Patan-551, Porbandar-251, Sabarkantha-868 and Valsad-1,591

20 Bharuch-9, Dahod-10, Dang-34, Jamnagar-2, Patan-0, Porbandar-0, Sabarkantha-39 and Valsad-45

WSSs[21] and installation of hand-pumps were made to provide drinking water to this geographically dispersed population. Contractors were responsible for repair and maintenance of mini schemes during the operation and maintenance period of five years and if by any reason, the scheme was not in working condition; contractor had to supply required quantity of potable water through tanker without any extra payment. Mini schemes have been executed in five out of eight test-checked Districts[22]. As per records, there were 1,474 mini schemes[23] (March 2018) in these five test-checked Districts.

Out of these, only 239 mini schemes (16.21 *per cent*) executed by GWSSB at Bharuch District were reported (April 2018 to August 2018) as non-functional. Further, as per records (April 2018 to August 2018) there were 16 mini schemes in the 78 test-checked habitations and all were reported functional. However, during joint physical verification (April 2018 to August 2018) of assets in these 78 test-checked habitations, 12 mini schemes (75 *per cent*) were found defunct though as per records, these were reported as functional schemes.

The above audit observation is of a nature that may reflect in other Districts also, which were not covered in the test-check conducted during audit. The Department/Government may internally examine all such defunct schemes and take necessary remedial measures for their restoration.

The Principal Secretary in the exit conference (30 May 2019) stated that identification of non-functional/defunct schemes is in progress and remedial action for reviving the scheme would be taken.

2.1.7.3 Dropped schemes

As per NRDWP guidelines, for in-village schemes, the village shall deposit 10 *per cent* of the estimated cost of the scheme as public participation, except for tribal villages, where the same is borne by the Tribal Development Department of GoG.

Audit observed that out of 1,597 in-village schemes[24] approved for the eight test-checked Districts during 2013-18, 77 schemes[25] had been dropped later. Out of these 77 dropped schemes, 22 schemes[26] (29 *per cent*) were dropped due to insufficient/no pubic contribution/internal dispute among villagers. Remaining 55 schemes[27] were dropped due to source failure (53), delay in commencement of work by Pani Samiti (1) and non-availability of land (1). Audit observed that WASMO did not explore alternate source of water for the schemes, where the earlier identified sources failed. Further, WASMO did not undertake effective

21 These were implemented for habitations with a population of 150 to 250 and the components of the work are installation of a single phase power pump on a borewell of depth up to 150 meters, a PVC or concrete storage tank of 5,000 to 10,000 litres capacity and distribution line to one or more stand posts.

22 Except Jamnagar, Patan and Porbandar Districts

23 Bharuch-285 (239 of GWSSB and 46 of WASMO), Dahod-420 (203 of GWSSB and 217 of WASMO), Dang-125 of GWSSB, Sabarkantha-245 (110 of GWSSB and 135 of WASMO) and Valsad-399 (380 of GWSSB and 19 of WASMO)

24 Bharuch - 328, Dahod - 370, Dang - 129, Jamnagar - 86, Patan - 103, Porbandar - 28, Sabarkantha – 254 and Valsad - 299

25 Dahod - 25, Jamnagar - 7, Patan - 4, Porbandar - 6, Sabarkantha – 30 and Valsad - 5

26 Dahod - 1, Jamnagar - 7, Patan - 4, Porbandar - 6, Sabarkantha – 1 and Valsad - 3

27 Dahod - 24, Sabarkantha - 28 and Valsad - 1 (failure of source), Sabarkantha - 1 (delay in commencement) and Valsad – 1 (land problem)

IEC activities to pursue the habitants to resolve the issues involved in other cases so that these schemes could be implemented. Therefore, WASMO needs to put in more concerted efforts to revive the dropped/ failed schemes.

The Principal Secretary in the exit conference (30 May 2019) assured to do the needful in this regard.

- ***Non-execution of work by NGOs***

With the objective to provide potable water to 31 villages of Dahod District, the EE (GWSSB) awarded (August 2012) the work of 31 WSSs with estimated cost of ₹ 4.40 crore to two NGOs[28] with stipulation to complete the works within four months. In contravention to the provisions of the guidelines, the EE released (August 2012) ₹ 1.26 crore[29] to the NGOs as advance. Audit observed that one NGO (Kabir Trust) after executing work of ₹ 50.50 lakh had abandoned (2014-15) the work while the other NGO had not executed any work. GWSSB issued repeated instructions to these NGOs for refund of advance but they refused to do the same and finally issued (March 2015) instructions to file court case against the concerned EE and the NGOs. However, it was observed that the court case had been filed only against the NGOs, the outcome of which was still awaited and no action had been initiated to get the work completed to provide potable water to the targeted habitants.

The Principal Secretary in the exit conference (30 May 2019) stated that departmental action has been taken against the EE. However, details of action taken by the Department have not yet been provided to Audit.

- ***Abandonment of work***

GWSSB awarded (December 2010) the work of WSS for six villages/hamlets[30] of Zalod Taluka, District Dahod to an agency at the tendered cost of ₹ 64.69 lakh with stipulation to complete the works by June 2011. Scrutiny revealed that the agency[31] had abandoned the work after executing work to the tune of ₹ 48.28 lakh till March 2012. The reason for the abandonment of work by the contractor was not on records. As the agency had not re-started the work despite issuance of several reminders, the Deputy EE recommended (September 2014) for termination of the contract and for blacklisting of the agency. Audit observed that the agency had completed the work of only one village (Sanjeli) while the works of remaining five villages were lying incomplete though more than six years had elapsed since the work was abandoned by the agency. This indicated that adequate steps were not taken by the GWSSB to get the work completed either departmentally or by engaging other agency which resulted in deprival of scheme benefits to the habitants of these five villages.

The Principal Secretary in the exit conference (30 May 2019) assured that they would take necessary action after verification of the facts.

28 Kabir Trust, Gandhinagar – 13 WSSs (₹ 2.17 crore) and Navjagruti Sarvjanik Trust, Gandhinagar – 18 WSSs (₹ 2.23 crore)
29 Kabir Trust, Gandhinagar –₹ 82.00 lakh and Navjagruti Sarvjanik Trust, Gandhinagar – ₹ 43.70 lakh
30 (i) Nimevarod (Gamtal), (ii) Raliyati Bhura (Gamtal), (iii) Mundaheda (Talav Faliya), (iv) Kararh (Kalimahudi), (v) Bhamela (Damor) and (vi) Sanjeli (Bhagat Faliya)
31 M/s. R.M. Patel, Dahod

2.1.7.4 Idle Elevated Storage Reservoir and Sumps

Elevated Storage Reservoir (ESR) is an integral part of PWS schemes. Information furnished by the GWSSB and WASMO stated that there were 212 ESRs in the eight test-checked Districts (August 2018). It was also stated by GWSSB/WASMO that out of these, 26 ESRs in five test-checked Districts[32] (21 constructed by WASMO and five constructed by GWSSB) were not being utilised as on that date. The main reasons stated for their non-utilisation were (i) failure of water from source, (ii) damage of internal pipelines, (iii) VWSCs not willing to utilise the same, (iv) supply of water directly from source instead of storing in ESR, *etc.* Audit observed that no corrective actions were taken by both GWSSB and WASMO to ensure the utilisation of these ESRs.

During joint physical verification (August 2018) of assets in selected habitations, Audit observed that –

- In Bharuch District, two ESRs constructed at Rajpardi and Bhimpor habitations and two sumps constructed at Rajpardi and Madhavpura habitations under Rundh Rajpardi RWSS were found not being utilised. Thus, the villagers were denied of the benefit of treated water of RWSS. Though these structures were not in use, the same were reported as being used in the records of GWSSB. Similarly, a sump constructed under an RWSS in Bhodar village was also not being used since its construction, as inlet tap facility was not created to release water in the sump. Further, the villagers were also not willing to take water from the RWSS.
- In Valsad District, ESRs and sumps constructed in Dungri Faliya and Dhodiyavad habitations (GP-Tumbh, Taluka-Umbergaon) under Umbergaon East RWSS were not being used since its construction, as distribution networks were yet to be created (August 2018). Though these structures were not put to use, the same was being reported as put to use as per the records of GWSSB.

The above audit observations are of a nature that may reflect in other habitations also, which were not covered in the test-check conducted during audit. The Department/Government may internally examine all such cases with a view to ensure that the structures constructed for water supply are functioning.

The DWSU, Himatnagar (Sabarkantha District) stated that budget provision for connecting the pipelines from ESR has been made in the Annual Action Plan for the year 2018-19 and the work would be taken up after getting the approval of DWSC. It was also stated that thereafter, the ESR would be put to use. The DWSU, Valsad stated that the distribution pipelines got damaged during the course of widening of internal village road which would be got repaired during 2018-19. The District authorities of remaining test-checked Districts assured that the ESRs would be put to use in near future.

2.1.7.5 Drinking water facilities in rural schools and Anganwadis

- ***Drinking water facilities in rural schools***

One of the goals of NRDWP to be achieved by the year 2017 was to ensure access to safe drinking water in all Government schools. Education Department decided

32 Dahod-4, Jamnagar-2, Patan-12, Sabarkantha-6 and Valsad-2

(July 2015) to provide drinking water facility to 2,920 identified primary schools in the State, where there were no definite sources of drinking water. WASMO conducted (2015-16) a survey of schools and found that out of 2,920 schools, 1,921 schools did not have definite source of drinking water. Accordingly, funds of ₹ 12.00 crore (2015-17) was released to WASMO for providing drinking water facility in these 1,921 schools.

Audit observed that WASMO had completed the work in 1,384 schools and in two schools, the works were in progress (February 2019). However, as on February 2019, no work was taken up in the remaining 535 schools on the plea of non-finalisation of water source.

The Principal Secretary in the exit conference (30 May 2019) stated that the remaining schools will be covered at the earliest.

- ***Drinking water facilities in Anganwadis***

NRDWP guidelines envisage provision of drinking water facilities to Anganwadis on priority basis by the State Governments. During joint physical verification (April 2018 to August 2018) of Anganwadis of selected habitations of test-checked Districts, Audit found that 43 (37.07 *per cent*) out of 116 Anganwadis in 32 test-checked GPs had no facility of drinking water. It was also found that though Ultra Violet (UV)/Reverse Osmosis (RO) Water purifier systems had been provided to 62 out of 116 Anganwadis, 47 systems were non-functional due to non-availability of PWS, electric connection, water facility, over head water tank, *etc.*

The Principal Secretary in the exit conference (30 May 2019) stated that the remaining Anganwadis would be covered at the earliest.

2.1.8 Infrastructure for Water Quality

The standards set by Bureau of Indian Standards (BIS) for drinking water were followed by MoDWS in the preparation of Uniform Drinking Water Quality Monitoring Protocol (UDWQMP). This protocol describes specific requirements for monitoring drinking water quality to ensure provision of safe drinking water to the consumers.

2.1.8.1 Availability of infrastructure for water quality testing

NRDWP and UDWQMP guidelines envisage establishment of water quality testing laboratories at State, District and Taluka levels. The State had a Central Laboratory at GJTI designated as State Level Laboratory (SLL), 32 District Level Laboratories (DLLs) and 47 Taluka Level Laboratories (TLLs).

- ***State Level Laboratory***

NRDWP and UDWQMP guidelines envisage that the SLL shall have facility for analysing a full range of physical, chemical and microbiological parameters specific to drinking water quality and shall act as a State Referral Institute (SRI) to analyse specific or new/emerging water quality problems. The SLL shall also monitor the performance of DLLs and TLLs to ensure quality assurance and quality control in these laboratories. In addition, the SLL was required

to cross verify five *per cent* of the samples found unfit by DLLs. MoDWS instructed (May 2013) GoG to expedite setting-up of SLL with instruments such as Atomic Absorption Spectrophotometer and High Pressure Liquid Chromatography, *etc.* for analysis of heavy metals and pesticides residues in drinking water sources.

Audit observed that GoG could set-up the SLL cum SRI[33] only in 2015. However, instruments/equipment estimated to cost ₹ 4.00 crore were yet to be procured (May 2019). Due to non-availability of high end instruments/ equipment, Audit observed that the SLL was conducting only routine testing of water supplied in Gandhinagar District instead of conducting specific tests for analysis of heavy metals and pesticides residues. Further, during 2013-18, no samples had been called for from the DLLs for re-testing to cross verify the tests done by them. Thus, the objective of establishing SLL to act as SRI was not achieved.

The Joint Director (Scientific) of GJTI attributed the reasons for not conducting specific tests and re-test of samples of DLLs to non-availability of instruments/ equipment and shortage of manpower. It was also assured that re-testing of the unfit samples of DLLs would be carried out after providing training to the existing manpower.

GJTI instructed (2017-18) 12 randomly selected DLLs to conduct re-test of the samples found unfit by them. Audit observed that these DLLs re-tested 249 samples from the water sources found unfit by taking fresh samples from the same source; however, the results of re-test varied widely as compared to the original test result as detailed in **Appendix-VI**. This shows that the tests conducted by the DLLs were not reliable.

The Principal Secretary in the exit conference (30 May 2019) stated that the purchase of equipment for SLL is in process. It was further stated that the TLL of Kalol Taluka has been converted into Gandhinagar DLL and testing of water samples of water supplied in Gandhinagar District is being carried out at TLL, Kalol.

- ***District and Taluka level water testing laboratories***

As per UDWQMP, DLLs and TLLs should undertake drinking water quality monitoring of the sources under their jurisdiction by analysing physico-chemical and microbiological parameters in drinking water sources prescribed under IS 10500-2012. These laboratories shall share the test results with the stakeholders[34] and spread awareness about water quality in rural areas.

Audit observed that against 245 Talukas in the State, GoG had established 47 TLLs till date (February 2019). Thus, 198 Talukas in the State had no laboratory for testing the quality of water, which was being done by the respective DLLs or by nearby TLLs in the adjoining Talukas. Though NRDWP guidelines envisage that 10 *per cent* of the TLL samples found unfit should be re-tested by the concerned DLL, Audit observed that none of the DLLs had re-tested the water samples found unfit[35] by the TLLs.

33 GJTI campus at Gandhinagar

34 Including District/State Public Health Departments and also with other laboratories established/proposed under Food Security Act, *etc.*

35 1,46,546 water samples during 2013-18

The Joint Director (Scientific) of GJTI stated that after establishing requisite infrastructure in the DLLs, re-testing would be carried out.

NRDWP guidelines also provide that each and every source of water shall be tested for chemical parameters once in a year and twice for bacteriological parameters *i.e.* once during pre-monsoon period and once during post-monsoon. There are 5,78,866 reported water sources in the State as of February 2018. As per norms, at least 5,78,866 water samples should have been tested for chemical parameters and 11,57,732 water samples should have been tested for bacteriological parameters during the year 2017-18. However, Audit observed from the information furnished by GJTI that only 1,86,431 samples (32 *per cent*) were tested for chemical parameters and only 1,23,771 samples (11 *per cent*) were tested for bacteriological parameters during the year 2017-18. The reasons for shortfall in testing were attributed to insufficient TLLs in the State.

Picture 1: Various water samples received in DLL, Himatnagar for testing (25-04-2018)

In addition to the above, Audit also observed that as per UDWQMP, quantity of samples for general analysis should be two litres in non-acidified container and for bacteriological analysis, the quantity should be 250 ml. in sterilized bottles. GJTI informed that as normal practice, the laboratories in the State collect samples for chemical and microbiological tests in one litre polyethylene container and 300 ml. sterilised bottles respectively. However, during visit to test-checked DLLs, it was observed that the samples were being collected even in discarded plastic bottles of cold drinks and packaged drinking water bottles **(Picture 1)**. Consequently, the test results were not free from risk of incorrect finding. The Laboratory Assistant of DLL Himatnagar accepted ignorance about the type of container required to be used.

The Principal Secretary in the exit conference (30 May 2019) stated that necessary action would be taken for strengthening the DLLs and TLLs.

- ***Mobile Laboratories***

To strengthen the work of water quality, monitoring and surveillance under NRDWP, GoG procured (January 2014) six mobile laboratory vans at the cost of ₹ 1.55 crore. Of these, five vans were allotted (August 2014) to five zonal offices[36] of GWSSB for use by the DLL of the concerned District and the remaining one was allotted to GJTI. The staff requirement for operating these vans was to be outsourced.

Audit observed that the mobile vans were not being optimally used by the DLLs as shown in **Table 1** –

36 Ahmedabad, Bhuj, Junagadh, Rajkot and Vadodara

Table 1: Details of utilisation of mobile vans by five DLLs

Zonal office	Reasons for non-use
Vadodara	Not utilised since January 2016 for want of driver and chemist.
Ahmedabad	Utilised intermittently till April 2017. Not utilised thereafter for want of chemist.
Rajkot	Utilised intermittently till March 2018.
Bhuj	Utilised intermittently till January 2017. Not utilised thereafter for want of chemist.
Junagadh	Utilised intermittently till February 2018. Not utilised thereafter for want of repairs of instruments/equipment.

(Source: Information provided by GJTI)

In case of mobile van with GJTI, Audit observed that the van was used intermittently for 25 months. During the course of field visit by Audit (April 2018), it was noticed that all the instruments/equipment from the van had been removed and were kept in the SLL building. Further, inner condition of the van was found frail. This indicated that the van was not being used optimally for conducting the tests and the expenditure incurred for the procurement of these vans remain unutilized.

The Principal Secretary in the exit conference (30 May 2019) stated that regular testing through mobile vans would be ensured.

2.1.8.2 Manpower in Laboratories

Uniform Drinking Water Quality Monitoring Protocol (UDWQMP) issued by Ministry of Drinking Water and Sanitation, GoI prescribed a suggestive list of staff required for various levels of laboratories. Audit observed that GoG had not sanctioned any post for SLL, DLLs and TLLs. Majority of staff in these laboratories had been filled through outsourcing.

Details of staff available *vis-à-vis* the list suggested as per UDWQMP as on 31 March 2018 are given in the **Table 2** below -

Table 2: Details of staff available in the Laboratories *vis-à-vis* staff suggested under UDWQMP

Name of the Laboratories in the State	Number of staff suggested as per UDWQMP	Number of staff available	Shortage
State Level Laboratory	14	12	02
District Level Laboratories	256	196	60
Taluka Level Laboratories	376	209	167

(Source: Data furnished by GJTI)

UDWQMP further suggested that each laboratory should have at least one regular post of water analyst/chemist. Audit observed that GoG had not sanctioned any regular post for the same. The work of chemist/analyst was being discharged by outsourced personnels.

Shortage of staff and non-availability of TLLs contributed to non-achievement of targets prescribed for testing the required number of water samples.

Audit is of the view that GoG may review the requirement of technical staff for water testing laboratories and fill up the vacancy.

2.1.8.3 Non-examination of prescribed parameters by the laboratories

UDWQMP stipulates that SLL shall examine 76 parameters, DLL shall examine 34 parameters and TLL shall examine 19 parameters **(Appendix-VII)**. However, Audit observed that against these, the SLL, DLLs and TLLs examined only 16, 14 and 14 parameters respectively. Thus, none of the Laboratories in the State examined the full set of envisaged parameters due to non-availability of required instruments/equipment and chemicals.

UDWQMP also stipulates that the DLLs and TLLs shall atleast mandatorily examine 13 basic parameters, which *inter-alia* included pH, TDS, total hardness, alkalinity, fluoride, chloride, nitrate, arsenic, iron, E-coli, *etc.* However, Audit observed that none of the laboratories in the State conducted tests for iron and arsenic because they were not having the instruments/equipment required for testing these parameters.

The Principal Secretary in the exit conference (30 May 2019) stated that the testing of at least 34 parameters in the State would be ensured in future.

2.1.8.4 Field Testing Kits (FTKs)

WASMO procured (2013-16) 35,900 FTKs[37] at a cost of ₹ 3.14 crore[38] with the objective to carry out rural community based quality monitoring and surveillance programme in the State. The FTKs were allotted to GPs (Sarpanch/Pani Samiti/ Asha workers) and Multi Purpose Health Workers (MPHW) of the Public Health Sub-Centres through DWSUs.

Out of 32 GPs in 78 test-checked habitations, only 13 GPs[39] had received 17 FTKs from the concerned DWSU. Audit observed that only one FTK was being used by Kamalpur GP of Sabarkantha District while the remaining 12 GPs were not using the 16 FTKs (94 *per cent*) provided to them and the same were not usable now, as the life span of these FTKs was only one year. Further, out of 45 FTKs provided to MPHWs for 78 test-checked habitations, only 12 FTKs had been utilised by the MPHWs in 12 out of 78 test-checked habitations. Remaining 33 FTKs were lying unutilised whose shelf-life had expired. As WASMO/DWSUs did not provide new FTKs or refilling materials after 2016, the FTKs which were being utilised also remained unusable. Thus, the expenditure incurred on the purchase of these FTKs proved unfruitful.

The Principal Secretary in the exit conference (30 May 2019) stated that training programmes for GP level functionaries and MPHWs would be conducted to ensure proper utilisation of FTKs.

37 It helps to identify unsafe water supply system on immediate basis and the consumer can have general idea about the water being used.

38 2013-14 : ₹ 1.36 crore for 13,000 FTKs, 2014-15 : ₹ 0.37 crore for 3,900 FTKs and 2015-16 : ₹ 1.41 crore for 19,000 FTKs

39 Bharuch District – Devla, Bhodar, Ranipara and Rajpoardi GPs (April 2014), Dang District – Don, Chichali, Gavdhad and Dahar GPs (May-June 2014), Sabarkantha District – Kamalpur GP (February 2016) and Valsad District – Motidholdungri, Pipalpada, Tumbh and Maroli GPs (June-July 2014)

2.1.9 Quality of potable water supplied

The IS 10500:2012 standards set by BIS for drinking water quality, which is followed in UDWQMP, has two limits *i.e.* desirable limits and maximum permissible or cause for rejection limits. If any parameter exceeds the permissible limit, the water is considered unfit for human consumption. Broadly, water is defined unfit for drinking if it is bacteriological contaminated (presence of indicator bacteria particularly E-coli, viruses, *etc.*) or if chemical contamination such as fluoride, Total Dissolved Solids (TDS), iron, manganese, arsenic, nitrates *etc.* exceeds maximum[40] permissible limits.

In Gujarat, as per the data of the CGWB, 20 Districts in the State are affected by salinity contamination, 18 Districts by fluoride, 17 Districts by chloride, six Districts by iron and 22 Districts by nitrate.

Audit scrutiny revealed that there was no provision for filtration of water in the habitations covered under in-village PWS schemes based on local sources or mini WSSs or IVWSSs based on ground water and in the villages getting water through hand pumps/tube wells.

GoG claimed in its Annual Action Plan for the year 2016-17 that the State is now free from Quality Affected habitations but some slip back habitations may emerge in near future. The claim of GoG was not correct as 20,906 samples out of 1,30,857 samples (15.98 *per cent*) failed in the chemical examination conducted by the laboratories of GJTI during 2015-16. Similar trend continued in 2016-17 and 2017-18 when 19,171 samples (15.60 *per cent*) out of 1,22,909 samples and 36,427 samples (19.54 *per cent*) out of 1,86,431 samples failed in chemical examination. Audit observed that the GJTI during the pre-monsoon survey of 35,433 habitations in 2017-18 found that the sources of 3,714 habitations (10.48 *per cent*) were unfit and during post-monsoon survey of these 35,433 habitations in 2017-18, the sources of 3,694 (10.43 *per cent*) habitations were found unfit. This indicates that about 10 *per cent* habitations in the State had no fit source of potable water.

The Principal Secretary in the exit conference (30 May 2019) assured to verify the number of quality affected habitations and to take necessary measures.

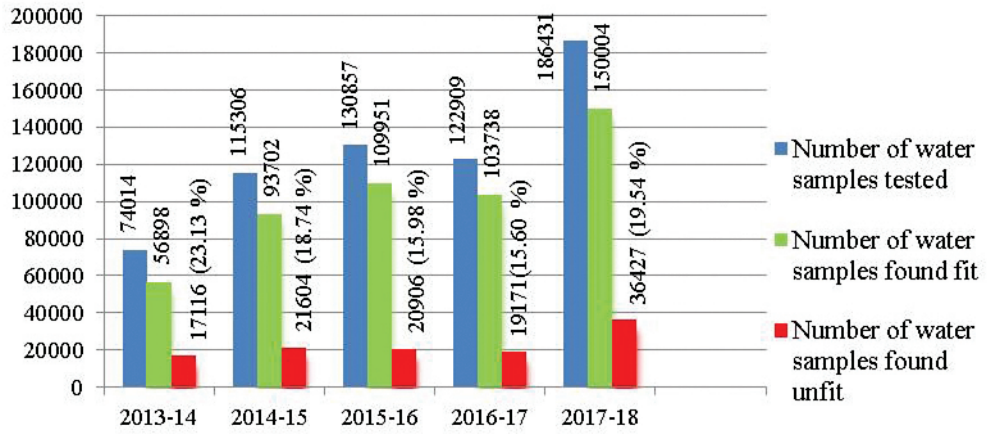
2.1.9.1 Chemical Contamination in potable water

The presence of certain chemicals in drinking water above the prescribed limit causes major diseases *e.g.* arsenic causes cancer, fluoride causes fluorosis, nitrate hampers the blood's capacity to transport oxygen resulting in brain damage, iron causes hemochromatosis, *etc.* GoG stated (March 2016) to GoI that the State was not water quality affected.

As per the information furnished to Audit by GJTI, the results of potable water samples tested in the laboratories of the State during 2013-18 are shown in **Chart 2** –

40 Fluoride (>1.5 mg/litre), TDS (>2,000 mg/litre), iron (>0.3 mg/litre), manganese (>0.3 mg/litre), arsenic (>0.05 mg/litre, amended to >0.01 mg/litre in June 2015) and nitrates (>45 mg/litre)

Chart 2: Showing the results of potable water samples tested in the Laboratories



(Source: Information furnished by GJTI)

From the above, it can be seen that out of 6,29,517 water samples tested in the State during 2013-18, 1,15,224 samples (18.30 *per cent*) were found chemically unfit. Of these, 27,269 samples (4.33 *per cent*) had excess content of fluoride, 74,866 samples (11.89 *per cent*) had excess content of nitrate and 19,245 samples (3.06 *per cent*) had excess content of TDS.

During joint physical verification (April 2018 to August 2018) of assets in 78 test-checked habitations, the staff of DLL collected 188 water samples[41] in the presence of Audit. These samples were tested by the concerned DLL for chemical parameters. Test results revealed that 54 samples[42] (29 *per cent*) out of 188 **(Appendix-VIII)** were unfit due to excess chemical contaminations than the maximum permissible limit. Further, the samples collected included 40 samples from RWSSs, which supplied water after treatment at Water Treatment Plant (WTP). Out of these 40, eight[43] (20 *per cent*) samples were found unfit.

Thus, the above facts prove that the claim (March 2016) of GoG in the IMIS furnished to the GoI that not a single habitation was quality affected was not correct.

- ***Nitrate and Fluoride contamination in drinking water***

Excess nitrate in drinking water causes Methaemoglobinaemia, which decreases the ability of blood to carry vital oxygen around the body, "blue baby syndrome[44]" disease among infants and children which may have breathing trouble, vomiting and diarrhoea. Some cases may be fatal. Excessive consumption of fluorides for a long period results in deleterious effects on different tissues of the body such as teeth (dental fluorosis), bone (skeletal fluorosis) and soft tissues (non-skeletal fluorosis). Dental fluorosis is irreversible and its treatment requires complex and expensive procedures which are time consuming and are not easily available to rural population. In case of skeletal fluorosis, there is no specific treatment.

As mentioned in the preceding Paragraph, overall contamination as regards nitrate and fluoride as per samples tested during 2013-18 in the State was 11.89 *per cent* and 4.33 *per cent* respectively. Districts which had high contamination

41 (i) Bharuch - 21, (ii) Dahod - 36, (iii) Dang - 37, (iv) Jamnagar - 18, (v) Patan - 11, (vi) Porbandar - 14, (vii) Sabarkantha – 22 and (viii) Valsad - 29

42 Bharuch – 5, Dahod – 17, Dang – 2, Jamnagar – 7, Patan – 3, Porbandar – 3, Sabarkantha – 16 and Valsad - 1

43 (i) Sonasan - Sabarkantha, (ii) Songadh habitation - Sabarkantha, (iii) Songadh near primary school – Sabarkantha, (iv) Umra headworks - Bharuch, (v) Thakor Talavdi Sub-headworks - Bharuch, (vi) Devla habitation - Bharuch, (vii) Devla navi nagri – Bharuch and (viii) Pati - Patan

44 Infant may seem healthy but show signs of blueness around the mouth, hands and feet

of nitrate in the State were Chhotaudepur, Dahod, Banaskantha, Panchmahal and Vadodara. Similarly, the Districts worst affected by fluoride contamination were Dahod, Chhotaudepur, Panchmahal, Banaskantha and Kheda. The position as regards nitrate and fluoride contamination in the eight test-checked Districts based on the samples tested during 2013-18 is depicted in **Appendix-IX**.

Audit observed that out of 54 water samples found unfit from the 188 samples collected during joint physical verification, 41 samples were unfit due to content of nitrate/fluoride being more than the maximum permissible limit. However, the water was being used for drinking and cooking purposes from these sources as these habitations had no alternate source.

- ***Community Water Purification Plant (CWPP)***

MoDWS advised (October 2016) all the States to install CWPPs in reported arsenic and fluoride affected habitations by March 2017. However, Audit observed that though 27,269 samples in the State during 2013-18 were found unfit due to excess content of fluoride as discussed above, GoG did not procure any CWPPs during 2013-18. This indicated that despite instructions from GoI, GoG did not install CWPPs at all fluoride affected source/delivery points.

The Principal Secretary in the exit conference (30 May 2019) stated that in the fluoride affected areas, where CWPP were not installed, the availability of alternate source of water would be explored.

2.1.9.2 Bacteriological contamination in potable water

Bacteriological contamination (E-coli, total coliform) in drinking water may cause water borne diseases such as diarrhea, cramps, nausea, headaches, vomiting, gastroenteritis, typhoid fever, cholera, *etc.* Audit observed that as per UDWQMP, all water sources should be tested at least twice every year for all parameters. However, in the test-checked Districts, water samples were collected for bacteriological examination only from RWSSs owned and managed by GWSSB. Water samples were not collected from sources such as in-village schemes, mini schemes, local body schemes, *etc.*

The pre-monsoon and post-monsoon bacteriological testing done in the State during 2013-18 revealed that 31,322 water samples (5.61 *per cent*) out of 5,58,156 samples checked during that period were found unfit for bacteriological parameters. Out of 1,23,771 water samples tested in the State during 2017-18 for bacteriological examinations, 3,494 samples (three *per cent*) were found unfit.

2.1.9.3 Non-reporting and non-marking of unfit sources/delivery points

NRDWP guidelines provide that the laboratories shall inform the concerned authorities (GWSSB, WASMO and GP) about the results of the water samples tested by it. GWSSB and WASMO were also required to inform the concerned GP about the test results and make them aware of the health hazards of using unfit water. They were also responsible to mark the source/delivery point as unsafe. Further, for water supplied through RWSS, GWSSB was responsible to provide quality water after treatments through WTPs.

During joint physical verification (April 2018 to August 2018) of assets in 78 test-checked habitations, Audit observed that though the laboratories had found 81[45]

45 Bharuch - 11, Dahod - 9, Dang - 9, Jamnagar - 22, Patan - 1, Sabarkantha – 26 and Valsad - 3

out of 1,400 samples collected from these habitations during 2013-18 as unfit, the sources were not marked to restrict the use of water from these sources. As such, the habitants were using the contaminated water and were not even aware about the same. Even the test results had not been communicated to the concerned GP. During joint survey, 308 (16 *per cent*) out of 1,920 households surveyed reported that they were not satisfied with the quality[46] of water being supplied.

The above facts indicate that the very objective of testing the samples of water was defeated as the concerned GPs/habitations were not aware of the contamination and continued usage which may lead to health risks as discussed in **Paragraphs 2.1.9.1 and 2.1.9.2**.

The Principal Secretary in the exit conference (30 May 2019) stated that corrective measures would be taken for marking the unsafe sources of water.

2.1.10 Financial Management

WSD had incurred expenditure of ₹ 13,037.63 crore in the implementation of various RWSSs including ₹ 2,379.48 crore of GoI grant under NRDWP during 2013-14 to 2017-18. The details of funds received and expenditure incurred under various schemes during 2013-18 are shown in **Table 3** –

Table 3: Receipt and expenditure of funds under various schemes during 2013-18
(₹ in crore)

Name of the schemes	Amount	
	Receipts	Expenditure
Research and Development	18.00	17.35
NRDWP (GoI Share)	1,663.55	2,379.48
RWSSs including NRDWP – GoG Share	5,935.64	6,612.79
RWSS based on Sardar Sarovar Canal	3,310.80	3,982.46
Drinking Water Infrastructure Protection Task Force	23.75	15.19
Water Conservation and Prevention of Wastage of Water	8.00	2.65
Mukhya Mantri Mahila Pani Samiti Protsahan Yojana	6.00	4.28
Local 10 *per cent* contribution under Tribal Area Sub Plan	30.00	23.43
Total	**10,995.74**	**13,037.63**

(Source: Annual Administrative Report of the WSD)

In case of expenditure exceeding against the received grant, the excess expenditure is incurred for WSSs from the GWSSB funds. Year-wise details of expenditure under different schemes are given in **Appendix-X**.

2.1.10.1 Retention of Flood Relief Fund by the implementing agencies

Finance Department (FD) of GoG released (October 2017) ₹ 164.05 crore to WSD from State Disaster Relief Fund (SDRF) for immediate restoration of WSSs, which were damaged during the flood of July 2017 in the different parts of the State. This grant was to be utilized by 10th March 2018 and the unspent amount was required to be surrendered to Government account. WSD released (November 2017) the funds to GWSSB, who in turn released (November 2017) ₹ 77.29 crore[47] to three implementing agencies based on their demand

46 As perceived by them (through colour, taste, odour, *etc.*)
47 ₹ 15.38 crore to GWIL, ₹ 15.45 crore to GJTI and ₹ 46.46 crore to WASMO

and retained the balance of ₹ 86.76 crore with it. Audit observed that these implementing agencies could utilise only ₹ 6.96 crore[48] and had refunded ₹ 60.19 crore[49] to GWSSB. Remaining ₹ 4.77 crore, ₹ 4.90 crore and ₹ 0.47 crore had been retained (April 2018) by WASMO, GJTI and GWIL respectively. GJTI had retained the funds for purchase of instruments for SLL and GWIL had retained the funds for strengthening of 1,650 mm diameter Bulk Pipeline SPP-3A in the river respectively. This was not permissible as the said grant was to be utilized only for the restoration of the damaged water supply schemes and not for the regular works. The details of expenditure and unutilized amount by GWSSB were not made available to Audit.

Audit further observed that GWSSB had neither furnished Utilization Certificate (UC) on the expenditure incurred nor surrendered (May 2019) the unutilized funds (including funds refunded by the three implementing agencies) to FD as stipulated in the grant release order.

2.1.10.2 Research and Development fund

WSD provides funds to GWIL, GWSSB and WASMO for carrying out Research and Development (R&D) activities such as (i) assessment of best technology in bulk transmission/distribution systems, (ii) auditing of pumping systems and energy efficiency performance improvement activity, (iii) water use efficiency-non revenue water, (iv) water conservation and water recharging, *etc.*

- ***Irregular expenditure of ₹ 4.57 crore by GWSSB***

GWSSB received ₹ 18.00 crore from WSD during 2013-18 for R&D activities. As reported by GWSSB, an expenditure of ₹ 15.98 crore out of ₹ 18.00 crore had been made during 2013-18. Audit observed in five test-checked Districts that an amount of ₹ 4.57 crore from R&D funds had been utilised irregularly for works other than R&D during 2013-18 as shown in **Table 4** –

Table 4: Details of R&D funds utilised for other works by test-checked Districts

(₹ in crore)

Name of the test-checked Districts	Year	Amount utilised for other works	Details of works executed
Sabarkantha	2016-17	0.37	Lift of office building, colouring of building, furnishing of conference hall, *etc.*
Bharuch	2016-18	0.22	Renovation work of the Division office of GWSSB and of DLL
Valsad	2013-18	1.53	Survey work, preparation of Draft Project Report (DPR) and Draft Tender Paper (DTP) for water supply schemes, preparation of agenda for the meeting, *etc*.,
Dang	2013-18	0.05	
Patan	2013-18	2.40	Construction of office building
Total		**4.57**	

(Source: Information obtained from test-checked District offices of GWSSB)

From the above, it may be seen that ₹ 4.57 crore were spent irregularly on works other than R&D, for which it was given.

48 ₹ 0.71 crore by GWIL, ₹ 0.55 crore by GJTI and ₹ 5.70 crore by WASMO
49 ₹ 14.20 crore by GWIL, ₹ 10.00 crore by GJTI and ₹ 35.99 crore by WASMO

The above audit observation is of a nature that may reflect in other Districts also, which were not covered in the test-check conducted during audit. The Department/Government may internally examine all such cases with a view to avoid irregular expenditure out of funds meant for R&D.

The Principal Secretary in the exit conference (30 May 2019) stated that the Department has defined the works/items falling under R&D activities. GWSSB replied (October 2019) that necessary oral instructions had been given by competent authority to concerned offices to adhere to the norms defined in R&D activities while incurring the expenditure.

2.1.10.3 Non-surrender of unspent grant to GoI

MoDWS released (2009-10) an amount of ₹ 14.04 crore to WASMO for start-up, communication, capacity development, quality check, monitoring and administrative cost, *etc.* under the erstwhile Swajaldhara scheme. In addition, WSD had also provided (2010-15) ₹ 4.52 crore for the said purpose. Audit observed that WASMO could utilise only ₹ 10.23 crore up to 2013-14 and the remaining unspent amount of ₹ 17.14 crore (including interest of ₹ 8.81 crore) was lying unutilised as of August 2018. Though GoI grant release order stipulated for refund of unspent grant, WASMO had not surrendered the unspent grant of ₹ 17.14 crore to GoI.

Similarly, an unspent grant of ₹ 0.79 crore (since 2013-14) and ₹ 1.21 crore (since 2014-15) under Reverse Osmosis (RO) plant scheme and Earthquake Rehabilitation Reconstruction (ERR) scheme of GoI respectively were also not surrendered (April 2018) to GoI.

WASMO assured (August 2018) that it would surrender the unspent balance under the Swajaldhara scheme after necessary verification and reconciliation of figures. However, the reply did not give any reason for non-utilization or non-surrender of unspent balances in time under the above schemes.

The Principal Secretary in the exit conference (30 May 2019) stated that the unspent grant would be refunded to GoI.

2.1.10.4 Non-payment of water charges by Gram Panchayats

GWSSB procures raw water from Irrigation Department, Sardar Sarovar Narmada Nigam Limited (SSNNL) and GWIL and supplies potable water after its treatment to Industries, Educational and other Institutes, GPs, Nagarpalikas and Municipal Corporations as per the rates[50] of water charge prescribed (February 2007) by GoG.

Audit observed that GPs did not pay the water charges for the potable water supplied to them by GWSSB. The details of water charges outstanding for recovery as on 31 March 2018 are shown in **Table 5** –

50 For industries: ₹ 15.00 per 1,000 litres, for GPs: ₹ 2.00 per 1,000 litres, Nagarpalikas: ₹ 4.00 per 1,000 litres and Municipal Corporation: ₹ 6.00 per 1,000 litres

Table 5: Details of water charges outstanding for recovery from GPs

(₹ in crore)

Test-checked Districts and State as a whole	Opening balance as on 01 April 2013	Water charges demanded from GPs during 2013-18	Total amount to be recovered	Amount recovered during 2013-18	Percentage of recovery	Outstanding recovery as on 31 March 2018
Bharuch	7.20	4.33	11.53	0.11	0.95	11.42
Dahod	1.89	0.93	2.82	0.00	0.00	2.82
Dang	3.11	2.08	5.19	0.10	1.93	5.09
Jamnagar	1.25	48.77	50.02	4.62	9.24	45.40
Patan	14.01	6.65	20.66	0.70	3.39	19.96
Porbandar	2.26	2.75	5.01	0.51	10.18	4.50
Sabarkantha	6.58	7.75	14.33	0.05	0.35	14.28
Valsad	2.41	3.36	5.77	0.15	2.60	5.62
State	**279.17**	**363.91**	**643.08**	**48.92**	**7.61**	**594.16**

(Source: Information provided by division/circle and headquarters office of GWSSB)

Audit observed that GWSSB issued the demand bills on quarterly basis but did not follow-up the same thereafter. Thus, due to inadequate follow-up by GWSSB, the percentage of recovery of water charges was only 7.61 *per cent* in the State during 2013-18. It may be seen from the above table that there was outstanding recovery of ₹ 594.16 crore as on 31 March 2018 from GPs in the State. Audit also observed that in the test-checked Districts, the percentage of recovery during 2013-18 ranged between zero *per cent* (Dahod) and 10.18 *per cent* (Porbandar). It was further observed that the figures of closing balance of outstanding recovery of a year did not match with the opening balance of the succeeding year and GWSSB did not take any action to reconcile the difference. It may be mentioned that GWSSB had incurred operational loss of ₹ 2,505.74 crore[51] during 2013-18 due to water charges being lower than operating costs.

The Principal Secretary in the exit conference (30 May 2019) stated that the proposal for providing subsidy to the consumers/GPs for payment of water charges is under consideration.

2.1.10.5 Improper billing due to absence of water meters

Audit observed that no metering system existed to measure the quantity of water being supplied to the GPs by GWSSB. GWSSB raised the bills to GPs on the basis of estimated population of the concerned GP and notional supply of water based on the installed capacity of the scheme for each habitant. Audit also observed that most of the tail end villages of a particular scheme were either not getting water or got very less quantity of water as mentioned in **Paragraph 2.1.7.1**. Further, though two out of 32 test-checked GPs were not using water from RWSS, but bills were raised by GWSSB against them. As mentioned in **Paragraph 2.1.10.4**, an amount of ₹ 594.16 crore was outstanding to be recovered from the GPs against the bills raised by GWSSB as on 31 March 2018. Audit is of the view that instead of raising demand on the basis of estimated population and notional supply of water, GWSSB may install water meters to record actual consumption, which would be easier to pursue for recovery.

51 (A) Expenses: Raw water cost ₹ 788.77 crore + O&M expenses ₹ 2,316.85 crore = ₹ 3,105.62 crore (minus) (B) Incomes: O&M grant ₹ 292.50 crore + water charges recovery ₹ 307.38 crore = ₹ 599.88 crore. (A) - (B) = ₹ 2,505.74 crore

Chief Engineer (Planning Cell) of GWSSB stated (March 2018) that metering was a costly affair. It was also assured that WSD would install water meters in a phased manner. Reply is not tenable as WSD had planned to cover 50 villages with metering device in the five year plan (2012-17) and based on the results achieved and response of the community, further strategy was to be developed for the whole State. However, Audit observed that WSD had not taken any action in this respect till March 2018.

The Principal Secretary in the exit conference (30 May 2019) reiterated that the water meters would be installed in phased manner. It was further stated that installation of water meter for water distributed through bulk pipe line is in progress.

2.1.11 Community participation

Pani Samitis, *i.e.* Village Water and Sanitation Committee (VWSC), are the key level organisation constituted by the Gram Sabha through consensus. It is a 10-20 member elected sub-committee of the GP and represent different castes and marginalized groups in the village. The Pani Samitis are responsible for planning, designing, implementing, managing, owning and carrying out operation and maintenance of village water supply system. Audit observed that community participation for implementation and management of all WSSs in the villages was ensured in the State by engaging VWSCs. During 2017-18, there were 17,452 Pani Samitis in the State. Audit further observed that participation of women in the VWSCs was also ensured through Mukhya Mantri Mahila Pani Samiti Protsahan Yojana by providing additional grant of ₹ 25,000 to VWSCs with 50 *per cent* or more women members. Number of Mahila Pani Samities[52] had increased to 495 (79 *per cent*) in the year 2017-18 from 276 in the year 2016-17.

2.1.12 Information, Education and Communication activities

Information, Education and Communication (IEC) activities is an important tool for the success of any programme/scheme, particularly, where people are directly involved.

In the eight test-checked Districts, Audit observed that 507 villages were not drawing water from the RWSSs. This indicated that the Department did not provide the information to the GPs and villagers about the benefits of RWSS and health risks posed by using water, the quality of which was not tested and assured. Audit further observed that the test results of water samples tested in laboratories were not being communicated to the concerned GPs and villagers, even the sources of water found unfit were not marked as unfit source to avoid use of water by the habitations. As a result, habitants with unfit source were not aware of the same and were using the contaminated water. During joint survey of 1,920 HHs, Audit observed that none of the members of the HHs surveyed had ever attended any IEC programme on water related issues arranged by the Department.

52 Pani Samitis having 50 *per cent* or more women members

NRDWP guidelines provide for establishment of Computerised Grievance Redressal System by each State Government with financial support from the MoDWS. Audit observed that though computerised system was not established in the State, a toll free number 1916 for grievance redressal was introduced in the State in November 2016. This was done for registration of complaints relating to water supply and quality issue and its redressal. There were 426 complaints received during 17 months (November 2016 to March 2018). During joint survey of 1,920 households, Audit observed that only one household had the knowledge of this toll free number. This indicated that the toll free number was not popular due to lack of IEC activities by the concerned authorities.

The above indicate that the IEC activities undertaken by the Department were not effective. Department may ensure effective implementation of IEC activities to make the rural population aware of the health hazards of using underground water so as to increase the coverage of habitations under RWSS. This would help to mitigate health hazards related to use of ground water.

The Principal Secretary in the exit conference (30 May 2019) stated that the Computerised Grievance Redressal System has now been developed.

2.1.13 Monitoring and Inspection

2.1.13.1 Institutional mechanism

As per NRDWP guidelines, a State Water and Sanitation Mission (SWSM) was to be set up in the State as an apex body for water supply and sanitation to provide policy guidance, convergence of water supply and sanitation activities, co-ordinating with various Departments of GoG, *etc.* GoG constituted (September 2003) the mission consisting of Chief Secretary and Secretaries[53] of various Departments of GoG as members with provision to meet at least twice a year. Audit observed from the information furnished by WSD (February 2018) that the mission had neither met nor any consultation were held since September 2005.

The Principal Secretary in the exit conference (30 May 2019) stated that the work of sanitation is being handled by the Rural Development Department.

2.1.13.2 Incorrect reporting by the State

In Gujarat, the information is fed in the IMIS at Taluka and District levels on monthly basis by field offices of WASMO and GWSSB, which is validated by their respective head offices. The information in IMIS is utilised for financial planning and budget allocation by the Central and State Governments.

Audit observed that the data was not being entered on regular basis. It was also observed that the data entered was not supported by any documentary evidences. An analysis of information available in the IMIS in Audit revealed that the figures of the closing balance of a particular financial year did not match the opening balance of the succeeding year as shown in **Table 6** –

53 Water Supply, Rural Development, Panchayats, Finance, Health, Planning, *etc.*

Table 6: Details of households having PWS connection in the State during 2013-18

Year	Total households in the State	Households having PWS in the beginning of the year	Households provided with PWS during the year	Total households having PWS at the end of the year
2014-15	71,19,197	45,26,352	85,244	46,11,596
2015-16	63,23,672	29,56,260	43,295	29,99,555
2016-17	64,77,558	45,18,434	2,34,967	47,53,401
2017-18	64,77,637	47,03,323	23,855	47,27,178

(Source: March ending IMIS data of each year)

The above table shows that the total number of households in the State during 2014-15 reduced by 7,95,525 in 2015-16 which normally should increase. Similarly, the total number of households having PWS at the end of 2014-15 reduced by 16,55,336 households in the beginning of the year 2015-16. Also the figures of closing balance did not match with the opening balance in the succeeding two years (2016-17 and 2017-18). These indicated that the figures reported of households provided with PWS connections in the State were not correct.

The Principal Secretary in the exit conference (30 May 2019) stated that training would be provided to the functionaries who are involved in data entry in the IMIS.

2.1.13.3 Absence of periodical monitoring of completed schemes

Management of in-village schemes is the responsibility of the GPs/Pani Samitis with institutional and technical support of WASMO. As per NRDWP guidelines, periodical monitoring and review of the functioning of completed schemes should be arranged through officers, experts, NGOs, institutions, *etc.* However, Audit observed that WASMO monitored only the schemes, which were ongoing. The completed schemes were not being monitored either by WASMO or any other authorities.

The Principal Secretary in the exit conference (30 May 2019) assured conduct of periodical monitoring.

2.1.14 Conclusion

Audit observed that the test-checked Districts had not prepared the WSP for the period 2012-17; however, the State WSP was prepared without considering the core level of planning *i.e.* District WSPs or Village WSPs. However, such plan was not prepared thereafter.

GoG reported that all 35,996 habitations in the State were fully covered with water supply; however, as per information provided by test-checked DWSUs, 37 out of 78 test-checked habitations had been partially covered. Out of 2,352 villages covered under 91 RWSSs in eight test-checked Districts, only 1,587 villages were getting water through RWSSs. Of the remaining 765 villages, 258 villages had no access of water due to insufficient water at source, non-creation of internal distribution networks, damaged pipes, *etc.*

As per records of DWSUs/Divisions of GWSSB of test-checked Districts, there were 377 non-functional schemes in these eight test-checked Districts. However, only 76 schemes (20 *per cent*) were reported as non-functional schemes in IMIS. During joint physical verification (April 2018 to August 2018) of assets in 78 test-checked habitations, 28 out of 65 in-village schemes/ IVWSS/mini schemes were found non-functional though as per records, these were reported as functional schemes. In the test-checked Districts, 77 schemes had been dropped due to insufficient public contribution, source failure, non-availability of land, *etc.*

SLL was found not working as State Referral Laboratory. Out of 245 Talukas in the State, 198 Talukas had no facility of TLLs. In absence of TLLs in each Taluka, only 32 *per cent* samples were tested for chemical parameters and 11 *per cent* samples were tested for bacteriological parameters during 2017-18. Two compulsory chemical parameters of water quality testing *i.e.* Iron and Arsenic, was not being tested in any laboratories. In the test-checked Districts, bacteriological testing was not being done for all sources except for water supplied from RWSS. Mobile Laboratory Vans allotted to GJTI and five zonal offices of GWSSB remained unutilized for want of driver, chemist and repairs of instruments/equipment. Field Test Kits meant for water quality testing was not utilized by GPs and MPHWs in test-checked habitations.

Eighteen *per cent* water samples tested during 2013-18 for chemical parameters in the State, were found unfit due to excess content of nitrate, fluoride, TDS, *etc.* Test results of 188 samples collected by the DLL staff in presence of Audit from 78 test-checked habitations and tested by the concerned DLL revealed the existence of above contaminations more than the permissible limit in 54 samples.

The IEC activities undertaken by the Department were not effective. Periodical monitoring of completed schemes was not being done.

2.1.15 Recommendations

State Government may -

- ***identify non-functional water supply schemes and operationalise them; and***
- ***review the requirement of technical staff for water testing laboratories and fill up the vacancy.***