



# Functionality Assessment of Household Tap Connection under National Jal Jeevan Mission - 2022



**STATE REPORT: GUJARAT**  
**SURVEY DURATION: FEBRUARY TO MARCH 2022**

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## Abbreviations

AWC	Aanganwadi Centre
FHTC	Functional Household Tap Connection
GoI	Government of India
GP	Gram Panchayat
HF	Health Facility
HH	Household
HGJ	Har Ghar Jal
JJM	Jal Jeevan Mission
LPCD	Litres per Capita per Day
MVS	Multi-village Scheme
NJJM	National Jal Jeevan Mission
RC	Residual Chlorine
O&M	Operation and Maintenance
OHT	Over Head Tank
PSU	Primary Sampling Unit
PWS	Piped Water Supply
SVS	Single Village Scheme
VAP	Village Action Plan
VWSC	Village Water and Sanitation Committee
WQMIS	Water Quality Monitoring and Information System

## Glossary

1. **Community** – Group of people living in one particular area or village/habitation
2. **Cross-sectional research** – A cross-sectional study is a type of research design in which data is collected from a relatively large and diverse group of people at a single point in time
3. **Drinking water source** – Groundwater (open well, borewell, tube well, handpump, spring, etc.)/ surface water (river, lake, pond, reservoir, etc.)/rainwater, available for drinking and domestic use
4. **Improved sources** – The following sources as considered improved by the National Family Health Survey definitions: Piped water into dwelling, yard/plot with a tap, piped water connected to public stand-posts, tube well or borewell, Hand pump, dug well–protected, Spring–protected, Rainwater, Water ATM/ Community RO plant/ Community Water Purification Plant (CWPP)
5. **Unimproved sources** – The following sources as considered unimproved by the National Family Health Survey definitions: Unprotected spring, unprotected dug well, cart with small tank / drum, Tanker/ truck, Surface water (river/ dam/ lake/ pond/ canal), and bottled water
6. **Functional Household Tap Connection (FHTC)** – A tap connection to a rural household for providing drinking water in adequate quantity of prescribed quality on regular basis.
7. **Functionality of FHTC** – Functionality of a tap connection is defined as having infrastructure, i.e., household tap connection providing water in adequate quantity, as presented:

Definitions	Fully-functional	Partially-functional	Non-functional
Quantity	$\geq 55$ LPCD	$> 40$ lpcd - $< 55$ LPCD	$< 40$ LPCD
Regularity	12 months or daily basis	9-12 months or $<$ daily basis	$< 9$ months or $<$ daily basis
Quality	Potable	Potable	Non potable

8. **Quantity (in litres)** of water received by households per person per day should meet the service level of 55 lpcd.
9. **Functionality Assessment** – An assessment of the functionality of rural household tap connections based on a sample survey
10. **Fully Regular** – Regularity of water is considered when a rural household receives water for 12 months on daily basis or as per schedule.
11. **Potability** – Potable water is water that is safe to be used as drinking water. Parameters of potable water are mentioned below:

Parameters for potable water tested in the survey	Unit	Acceptable Limit	Permissible Limit in the absence of alternative sources
i. pH (tested on site)	-	6.5 to 8.5	No relaxation
ii. Free residual chlorine (tested on site)	Mg/litre	0.2	1
iii. Turbidity	NTU	1	5
iv. Total hardness	Mg/litre	200	600
v. Total alkalinity	Mg/litre	200	600
vi. Chloride	Mg/litre	250	1000
vii. Ammonia	Mg/litre	0.5	No relaxation
viii. Phosphate	Mg/litre	0.3	1
ix. Iron (in hotspots only)	Mg/litre	1	No relaxation
x. Nitrate	Mg/litre	45	No relaxation
xi. Sulphate	Mg/litre	200	400

xii.	Total dissolved solids	Mg/litre	500	2000
xiii.	Fluoride	Mg/litre	1	1.5
xiv.	Arsenic (in hotspots only)	Mg/litre	0.01	No relaxation
xv.	Bacteriological test for Total coliform bacteria and E. coli or thermotolerant coliform bacteria		Shall not be detectable in any 100 ml sample	

12. **Sampling** – Selection of a subset of individuals from within a statistical population to estimate water service delivery among the population. In the current study, households have been sampled to estimate the representation of the village and subsequently of the district as well as of the state.
13. **Types of schemes:** Following are the piped water supply schemes that were assessed
  - a. Mini-solar based piped water supply scheme in isolated/tribal hamlets
  - b. Single Village Scheme (SVS) in villages having adequate groundwater that needs treatment
  - c. Single village scheme (having adequate groundwater/ spring water/ local or surface water source of prescribed Quality)
  - d. Retrofitting of ongoing schemes taken up under erstwhile NRDWP for the last mile connectivity/ retrofitting of completed rural water supply schemes to make it JJM compliant
  - e. Multi-village PWS scheme - with water grids/ regional water supply schemes
14. **Village Action Plan (VAP)** – Plan prepared by Gram Panchayat and/ or its sub-committee, i.e., VWSC/ Paani Samiti/ User Group, etc. based on baseline survey, resource mapping and felt needs of the village community to provide FHTC to every rural household, treat the generated greywater and plan its reuse, undertake surveillance activities, etc. VAP also indicates the fund requirement and timelines for completion of work under the Mission and will be approved by the Gram Sabha. Irrespective of the source of funding, all drinking water-related works in the village are taken up based on the VAP.
15. **Source Sustainability** – includes measures such as aquifer recharge, rainwater harvesting, increased storage capacity of water bodies, reservoirs, de-silting, etc. improve the lifespan of water supply systems
16. **Har Ghar Jal (HGJ)** – An administrative unit wherein all HHs are provided with water supply through FHTCs is called “Har Ghar Jal”.
17. **Public Institutions** – The public institutions in the survey include Aanganwadi Centre (AWC), Health Facilities, Schools, Gram Panchayat, and government buildings.
18. **Working tap connection** – A tap connection supplied water at least one day in the week, preceding of survey
19. **Functional Scheme** – A scheme is said to be functional if it was reported to be working for all 12 months in a year.

Note: The detailed analysis of data at the district level has been incorporated in the District Reports presented separately. The State Reports are to be read in concurrence to the District Reports.

## Executive Summary

Jal Jeevan Mission (JJM) was launched on the 15th of August 2019 with the objective to provide functional household tap connections (FHTCs) to all rural households. NJJM, GoI engaged HTA Kantar Public to conduct the 'Functionality Assessment' of the tap connection at households as well as public institutions/ buildings such as schools, anganwadis, gram panchayat buildings, public health facilities, and wellness centers in all the rural districts for the financial year 2021-22.

A cross-section research design was adopted for this functionality assessment study. As per the design, all villages having a piped water scheme (PWS) with 20 or more functional household tap connections were included in the sample frame. There after the required number of villages were randomly selected villages such that these are statistically significant at the district level.

In this study, data was collected from the households, and public institutions (i.e., schools, anganwadis, gram panchayat buildings, public health facilities and wellness centers, etc.) in the randomly selected villages. Water quantity and quality were also tested in the sampled households and public institutes. Quality testing was conducted for various parameters, out of which pH and residual chlorine were tested on the ground and for the remaining 12 different quality parameters water sample was collected and sent to the nearest NABL accredited district labs for testing.

The state of Gujarat lies in the western part of India and has a population of 6,04,39,692 (Census 2011). It has 33 districts and 18191 villages, and 17650 villages have PWS schemes. The state is yet to achieve the Har Ghar Jal status. A total of 385 villages, across all districts, and 13716 households were randomly sampled for the survey, and additionally, water samples from 1019 public institutions were tested.

Out of all the villages randomly surveyed in the FHTC assessment, 64 percent have only one scheme, 27 percent have 2-3 schemes, and 9 percent have 4 and more schemes. Mostly all schemes across the three types were found functional.

At the state level, 93% of the HHs were satisfied with the regularity of the supply, 95% with the quality of the water supplied, 96% with the colour of the water supplied, and 95% with the taste of the supplied tap water.

### Overall functionality status of Gujarat

At the state level, 99% of HHs received water on the day of the survey. While 71% of the HHs were found to have fully functional tap water connections within the premises. Out of which 87% received an adequate quantity of water, 88% reported receiving a fully regular supply of water, and 89% HHs received potable water.

It was found that more than 73% of households received water all 7 days a week and 20% received at least 3 to 4 days, while 6% of the HHs received water once a week. The average duration of water supply across the state was reported to be 3 hours per day.

In Gujarat, 8% of the villages have reported that water is directly supplied to the households and the remaining 92% reported that water was supplied via an overhead tank, sump, or both.

During the roll-out of the data collection in the state, all-district level NABL accredited laboratories (labs) extended their support in accepting and testing water samples from HHs and public institutions. One of the challenges identified by the labs was the capacity to test



more than 30-40 samples within 24 hours given the shortage of technicians and availability of necessary reagents in the required quantity. In Gujarat, 14641 samples of water were submitted, and 14334 were tested at the labs. The turnaround time of testing of water sample was more than 48 hours in most cases. Given this feedback, it can be conferred that these labs have limited scope to take up samples from the general public at large on a regular basis. The different quality parameters of the collected water samples that were tested were turbidity, total hardness, total alkalinity, chloride, iron, nitrate, sulphate, total dissolved solids, bacteriological test, arsenic, and fluoride.

Residual chlorine was found within the permissible limit only in 50% of the HHs. The percentage was relatively higher in Schools (more than 50%), wherein there is a possibility of additional chlorine being added locally for the purification of water. Even if 97% of samples passed in bacteriological parameter the RC was found only in 3%. A monitoring system to ensure the correct dosing of chlorine in the pipe water supply system is necessary for assuring potable water.

Out of the 13716 HHs sampled for the FHTC assessment, a water quality test was carried out in 13623 due to the non-availability of water in 1% HHs on the day of the survey. pH was found within the acceptable limit in 99% of households. Among the public institution, pH was found in the acceptable limit of more than 96% in all the public institutions.

80% of villages in the state reported having available field test kits. And more than three-fourths of these reported to have either VWSC/Pani Samiti or pump operators trained to use field test kits for testing the quality of water on-site.

### **Water quality management in village**

It was found that 89% of villages in the state reported having a VWSC or a Pani Samiti out of which 73% of the VWSC/Pani Samitis reported to have more than 50% female members. In the state, 42% of villages reported that VWSC/ Pani Samiti is responsible for the operation and maintenance of pipe water supply.

61% of villages reported having identified skilled manpower for O&M of PWS schemes. 10% of villages in the state reported having faced challenges with respect to O&M of PWS schemes.

96% of HHs reported that they are aware of any grievance redressal mechanism w.r.t. HH tap water through PWS, but only 10% HHs have reported a complaint in the last year and only 7% of complaints have been resolved. Among those who reported complaints (i.e., 10% HHs, 1308 HHs), 69% of the HHs reported their complaints to the GP functionaries besides other reporting channels.

Overall, 87% of villages in the state levy charge for water service delivery to households whereas 88% HHs reported paying water service delivery charges at the households.

93% of HHs reported that their daily requirement of water was being met by HH tap connections.

Overall, 98% of HHs reported using an improved source of drinking water, as their primary source. The state also needs to further strengthen communication for the quality of water supplied so that every household can use the same for drinking purposes.

Overall, 14% HHs reported using booster pumps to maximize the water flow through their piped water connections.

It was found that 61% of the villages have schemes that are based on groundwater sources, while 3% on surface water sources.

Age-wise functionality of the schemes indicates improvement in 'always functional' schemes and a decrease in the 'non-functional scheme' in the state since 2012. The percentage of fully

functional scheme was same from 2012 to 2013-18. In 2019 and later the figure for fully functional schemes increased by 3% to 91% and 0% for partially functional schemes (i.e., a total of 91% of schemes).

### **Impact of JJM**

Across the state, only 1% HHs reported having an incidence(s) of water-borne diseases in the last year.

Since having a functional HH tap connection, 71% HHs across the state have reported that there has been a change in the no. of employment days of the adult HH members while 22% HHs reported no change.

Out of the HHs reported (i.e., 10055) that female members used to fetch water before HH tap connection, 94% reported that post-installation of HH tap connection helped reduce of time and effort in collection of water.

Across the state, 50% HHs reported that since having a functional HH tap connection the attendance of the girls going to schools has increased, while 33% HHs reported no change in attendance which could possibly be an impact of shutting down of schools due to COVID-19 related lockdown during the survey period.

### **Functionality Status of Har Ghar Jal Districts**

At the state level for Har Ghar Jal districts, 100% of households received water on the day of the survey. While 72% of the households were found to have fully functional tap connections. Out of which 87% received an adequate quantity of water, more than four-fifths reported receiving a fully regular supply of water and 90% received potable water.

Since having a functional HH tap connection, 69% reported that there has been a change in no. of employment days. Out of the HHs in which female members used to fetch water before HH tap connection, 95% reported that post-installation of HH tap connection helped reduce time and effort in collecting water. Across the Har Ghar Jal district, 52% HHs reported that since having a functional HH tap connection their income has directly benefitted.

### **Functionality Status of Aspirational Districts**

At the state level for aspirational districts, 100% of households received water on the day of the survey. While 14% of the households were found to have fully functional tap connections. Out of which 68% received an adequate quantity of water, more than three-fifths reported receiving a fully regular supply of water and 51% received potable water.

Since having a functional HH tap connection, 73% reported that there has been a change in no. of employment days. Out of the HHs in which female members used to fetch water before HH tap connection, 78% reported that post-installation of HH tap connection helped reduce time and effort in collecting water. Across the aspirational district, 37% HHs reported that since having a functional HH tap connection their income has directly benefitted.



## 1. State Factsheet

Functionality status of tap connection at households	India	Gujarat
Working tap connections- HHs which received water through tap connection at least once in last 7 days (%)	86	99
Quantity <sup>1</sup> of water received by households		
Adequate quantity (>55 LPCD) (%)	85	87
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	5	5
Inadequate quantity (<40 LPCD) (%)	10	8
Regularity <sup>2</sup> of water received by households		
Fully Regular Supply (as per schedule) (%)	80	88
Partially Regular Supply (not as per schedule) (%)	14	7
Irregular Supply (less than 9 months' supply) (%)	6	5
Potable <sup>3</sup> (Quality) water received by households (%)	87	89
Overall functionality <sup>4</sup> (%)	62	71

Service delivery parameters	India	Gujarat
Overall user satisfaction on regularity at the household level (%)	83	93
Overall user satisfaction on quality at the household level (%)	82	95
Households receiving water supply daily-7 days a week (%)	74	73
Daily HH requirement of water being met by FHTC (%)	80	93
Households paying water service delivery charges (%)	35	88
Households aware of grievance redressal mechanism (%)	71	96
Households reported a reduction in time and effort in collecting water (%)	79	94
Average no. of times water is supplied in a day	1	1
Households reported incidence of water-borne diseases in the last year (%)	2	1
Households purifying water before drinking (%)	57	98
Residual Chlorine (RCL) detected within permissible limits (%)	24	50
Villages with Field Test Kits (%)	30	80
Villages in which bacteriological test was done in last 1 year by VWSC/ Pani Samiti (%)	29	77
Villages reported to have a mechanism for chlorination (%)	21	19

Service delivery parameters	India	Gujarat
Village reported having presence of VWSC/ Pani Samiti (%)	38	89
Villages in which VWSC/ Pani Samiti is responsible for Operation & Maintenance of PWS schemes (%)	14	42
Villages in which persons are trained to use Field Test Kits (%)	31	78
Villages levying water service delivery to households (%)	34	87
Villages having skilled manpower for Operation & Maintenance of PWS schemes (%)	31	61
Community monitoring of water wastage in villages (%)	19	53
Villages in which signages about JJM were observed (%)	15	64

<sup>1</sup> Quantity (in litres) of water received by households per person per day should meet the service level of 55 lpcd

<sup>2</sup> Regularity is receiving water for 12 months or daily basis as per schedule

<sup>3</sup> Potable water has been considered basis testing of water samples through laboratory tests for physical, chemical, and bacteriological parameters (within acceptable/ permissible range) and onsite testing of pH.

<sup>4</sup> Overall functionality has been computed as the intersection of Adequate Quantity, Fully Regular Supply and Potable (Quality) for households wherein water supply was available at the time of survey

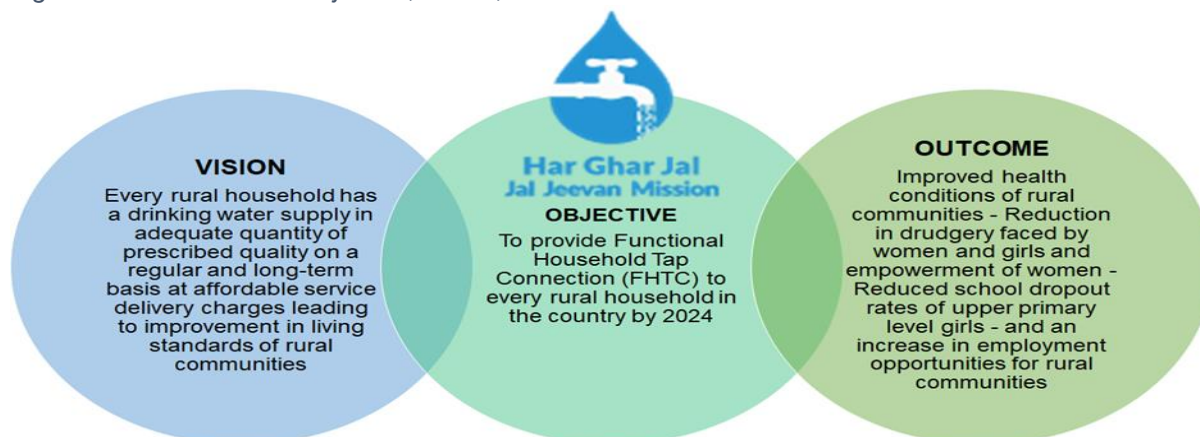
Functionality status of tap connection at households in Har Ghar Jal Districts	India	Gujarat
Working tap connections- HHs which received water through tap connection at least once in last 7 days (%)	91	100
Quantity of water received by households		
Adequate quantity (>55 LPCD) (%)	88	87
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	4	5
Inadequate quantity (<40 LPCD) (%)	8	8
Regularity of water received by households		
Fully Regular Supply (as per schedule) (%)	84	88
Partially Regular Supply (not as per schedule) (%)	11	7
Irregular Supply (less than 9 months' supply) (%)	5	5
Potable (Quality) water received by households (%)	90	90
Overall functionality (%)	69	72

Functionality status of tap connection at households in Aspirational Districts	India	Gujarat
Working tap connections- HHs which received water through tap connection at least once in last 7 days (%)	78	100
Quantity of water received by households		
Adequate quantity (>55 LPCD) (%)	85	68
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	5	6
Inadequate quantity (<40 LPCD) (%)	10	26
Regularity of water received by households		
Fully Regular Supply (as per schedule) (%)	77	61
Partially Regular Supply (not as per schedule) (%)	14	9
Irregular Supply (less than 9 months' supply) (%)	9	30
Potable (Quality) water received by households (%)	88	51
Overall functionality (%)	62	14

## 2. Context

Jal Jeevan Mission (JJM) was launched on the 15th of August 2019 with the objective to provide functional household tap connections (FHTCs) to all rural households.

Figure 1: Har Ghar Jal - Objective, Vision, & Outcome



In accordance with the overall objectives as specified in the Operational Guidelines for the implementation of the NJJM, GoI carried out a sample survey to assess the functionality of household tap connections. As part of this endeavour, NJJM, GoI engaged HTA Kantar Public to conduct the 'Functionality Assessment' of the household as well as public institution/buildings such as schools, anganwadis, gram panchayat buildings, public health facilities, and wellness centers in all the rural districts for the fiscal year 2021-22.

### 2.1. State snapshot: Gujarat

The state of Gujarat lies on the western part of India and has a population of 6,04,39,692 people. It has 33 districts and 18191 villages where 17650 villages have PWS schemes. The state lies on the Gujarat Plains and Hills region and receives an average annual rainfall of about 722.4mm. Among the villages with PWS schemes, 17351 villages (95.38%) have more than 20 households with functional tap connections. The state is yet to achieve the Har Ghar Jal status, however till date XX has been certified.

Presented here are state level information collated from the DDWS-IMIS:

Figure 2: State IMIS Status & Map

#### IMIS status:

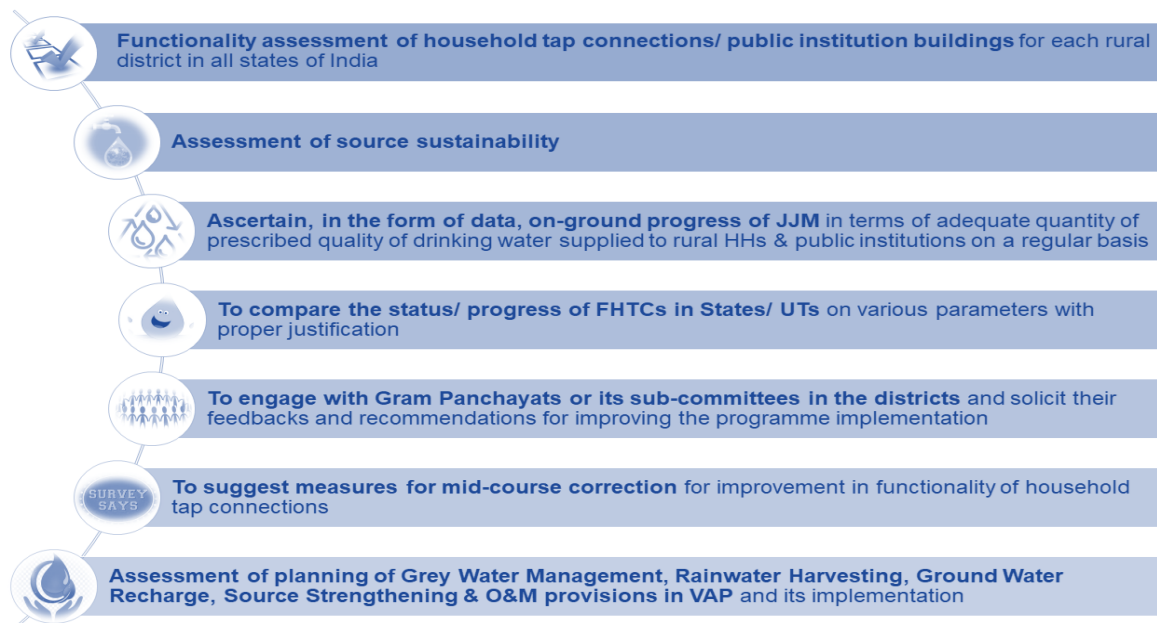
- Not a Har Ghar Jal state.
- 13 districts are Iron & 16 districts are Fluoride affected
- 17351 (95.38% of all) villages with PWS (>20 FHTC)
- 74.46% villages covered under HH tap connections under HGJ



## 2.2. FHTC Assessment Objectives

The overall objectives of the FHTC assessment are as presented:

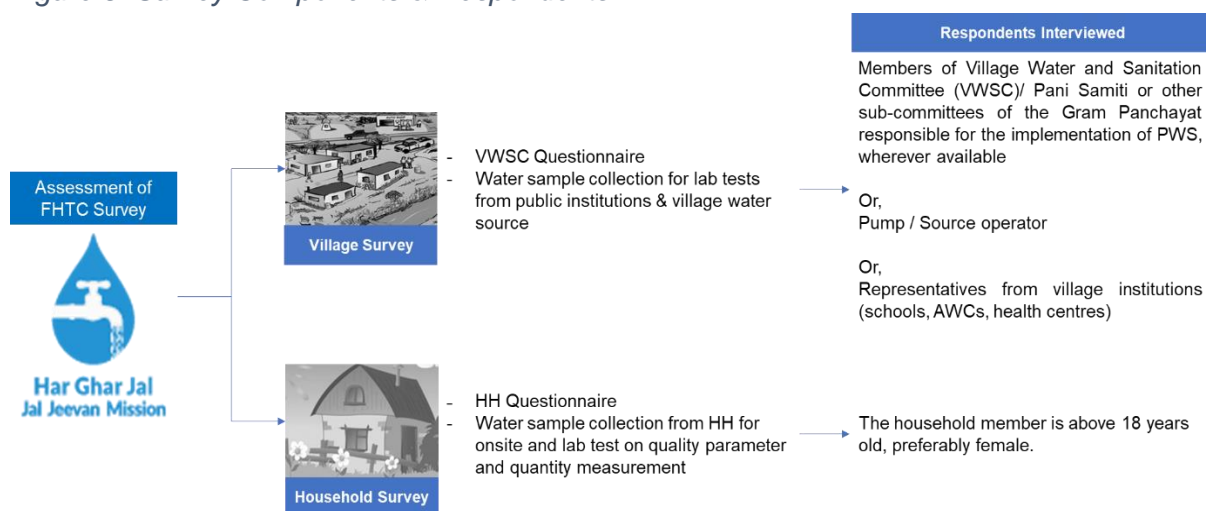
Figure 4: FHTC Assessment Objectives



## 2.3. Assessment Methodology

A cross-section research design has been used for this functionality assessment study. Quantitative data were collected from villages and households across all states/UTs using the CAPI (Computer Assisted Personal Interviewing) mode. The survey includes two components, village, and household.

Figure 5: Survey Components & Respondents



## 2.4. Sample Size

The sample size was calculated to provide estimates with a 95% confidence interval (CI) and 5% margin of error (MoE) after incorporating the correction factor for a finite population considering the total number of geographic units having FHTCs.

- Village sample is estimated to be representative at the state level
- HH sample estimated to be representative at the district level
- Number of Har Ghar Jal (HGJ) villages were proportionately sampled at the district level
- All PWS schemes (up to 4) were covered per village. Per scheme approximately 9 (3 each from the head, middle, and tail HHs) or 18 households (6 each from head, middle, and tail HHs) were sampled to achieve the desired sample at the district level.

## 2.5. Sampling Methodology

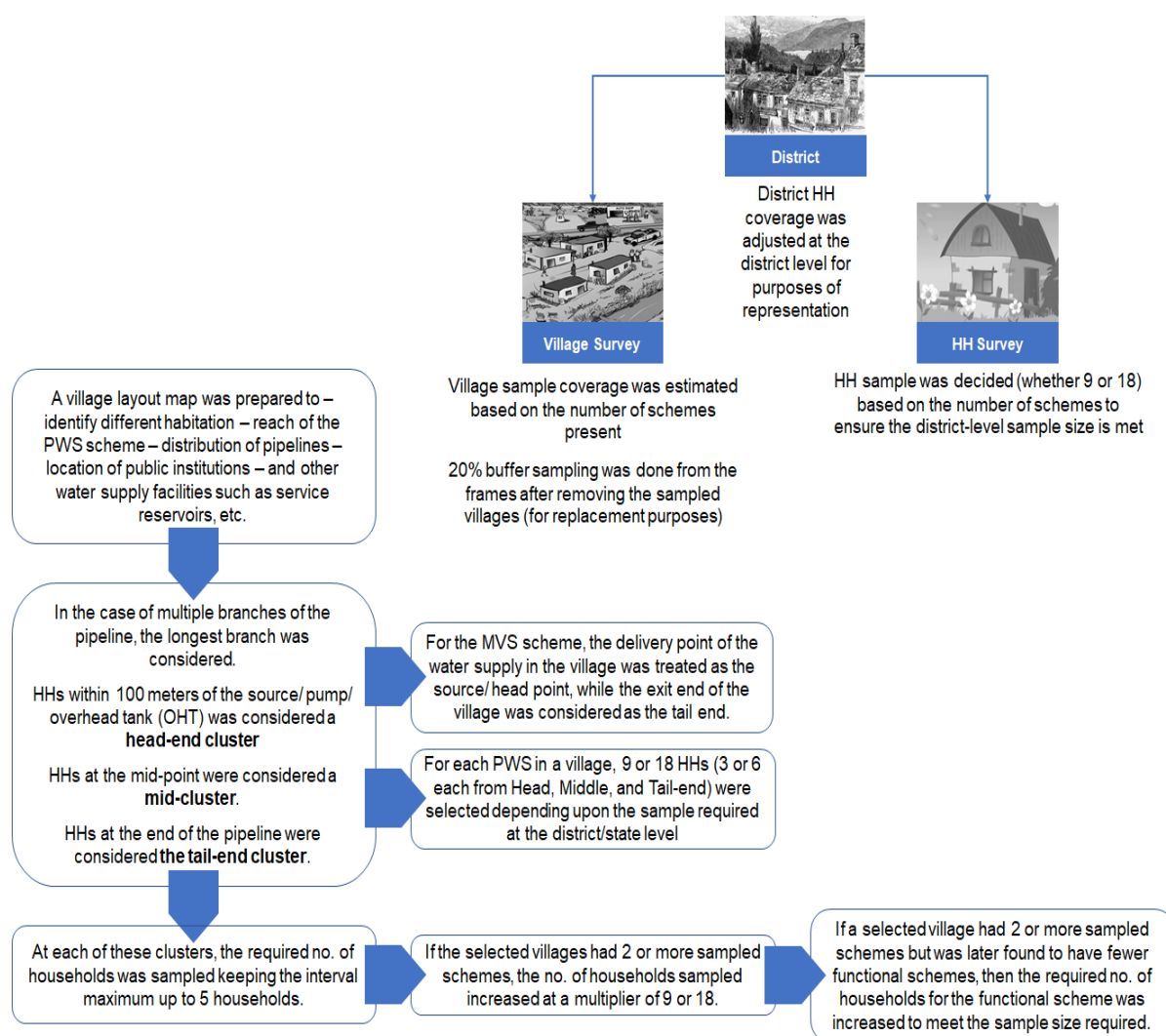
As per the design, all villages having a PWS scheme with 20 or more functional household tap connections were included in the sample frame. The probability proportionate to size (PPS) method was used for village selection in each district. The steps for random selection of villages using PPS are presented below:

Figure 6: Steps for Random Sampling of Villages



Figure 7: Household Selection

The key considerations for the village and household sampling were:

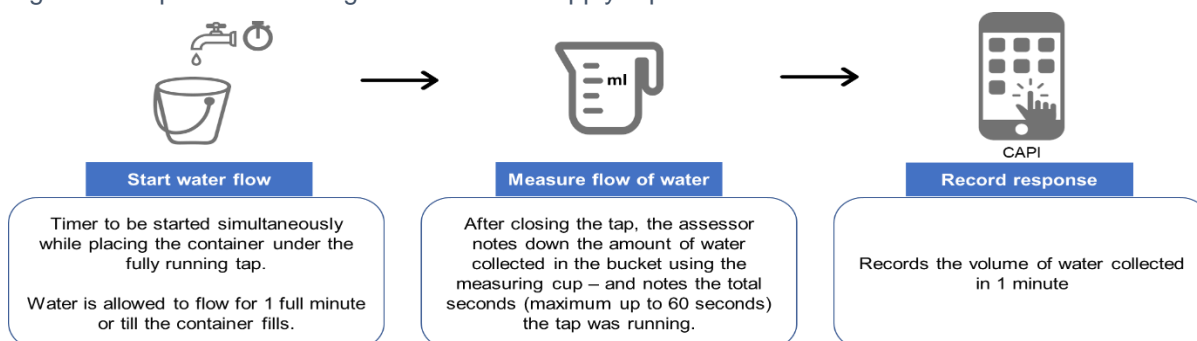


The record of all district-wise village replacements is maintained and reported as part of the annexure.

## 2.6. Methodology for Water Quantity Measurement at Households

The flow rate of the water supply was measured using a container with gradual markings (either 5 litres or 1 litre, based on the flow of the tap) and a stopwatch/timer-watch. The process followed is as described in Figure 6.

Figure 8: Steps for Measuring Flowrate from Supply-tap at HHs





In the case of households where the FHTC is connected directly with the storage tank, the following steps were adopted to measure the quantity:

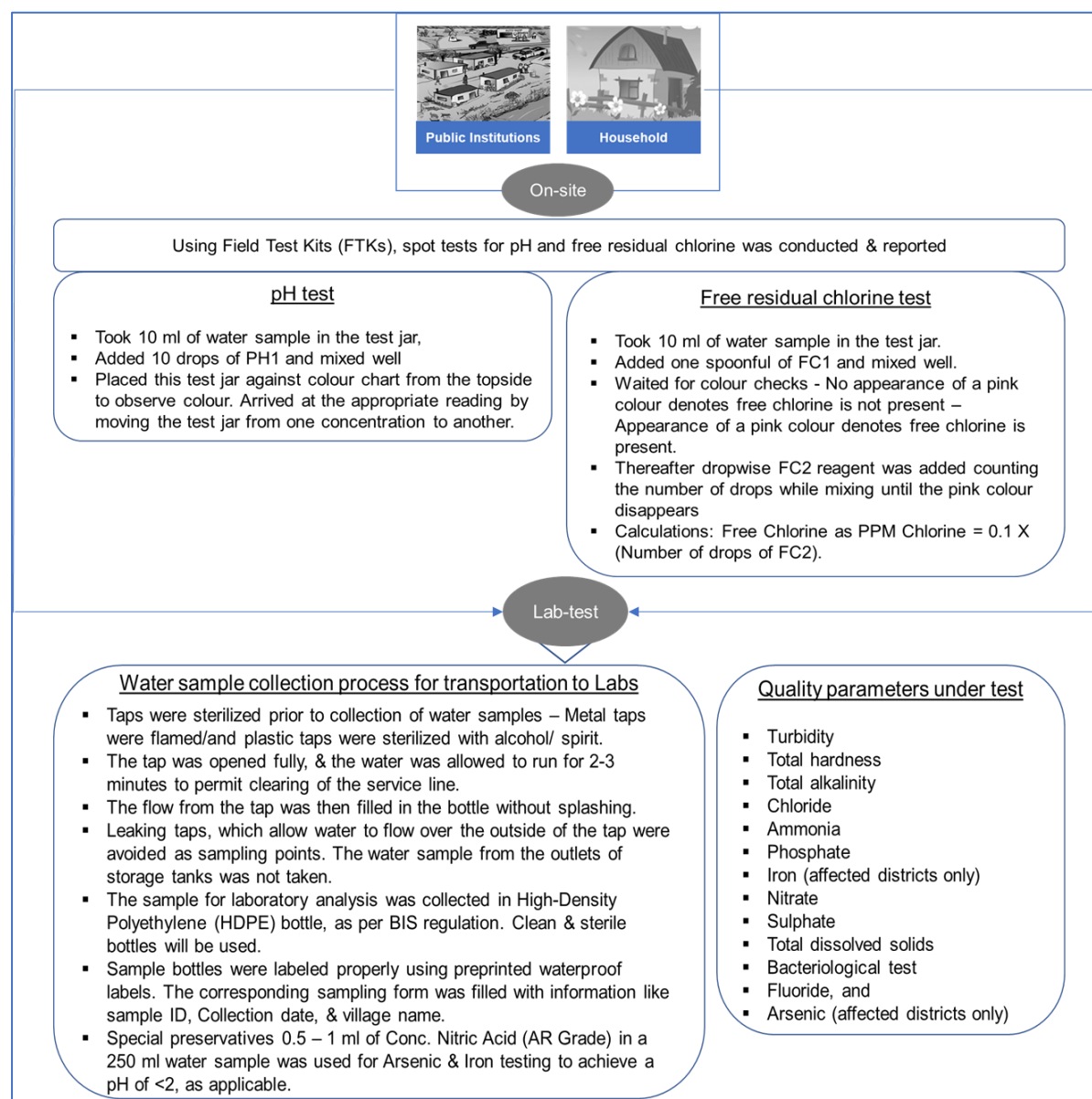
- Assessor first asked and recorded length, breadth, and height.
- Assessor dipped a 5 feet long rod, marked the level of the water table, and calculated the volume – length x breadth x-height of water.
- Next the assessor opened the valve of the connection and allowed the water to flow inside the storage for 10 minutes.
- After 10 mins, the valve was closed, and the assessor again dipped the rod and recorded the new height of the water inside the tank. Based on this new 'height' and the CAPI calculated the changed volume.
- The difference in the volume of water in 10 minutes divided by 10 provided the flow rate of the water supply per minute.

The water flow rate was not measured for village-level public institutions.

## 2.7. Methodology for Water Quality Measurement

Water quality was tested for all public institutions available in the villages, including schools, AWCs, gram panchayat buildings, public health facilities, and wellness centers, and at the selected households. Two types of quality tests were carried out – a) spot test for pH and free residual chlorine, and b) water sample was collected and transported to labs for testing against 13 quality parameters (total 15) as specified in Figure 7.

Figure 9: On-site & Laboratory-Based Quality Test

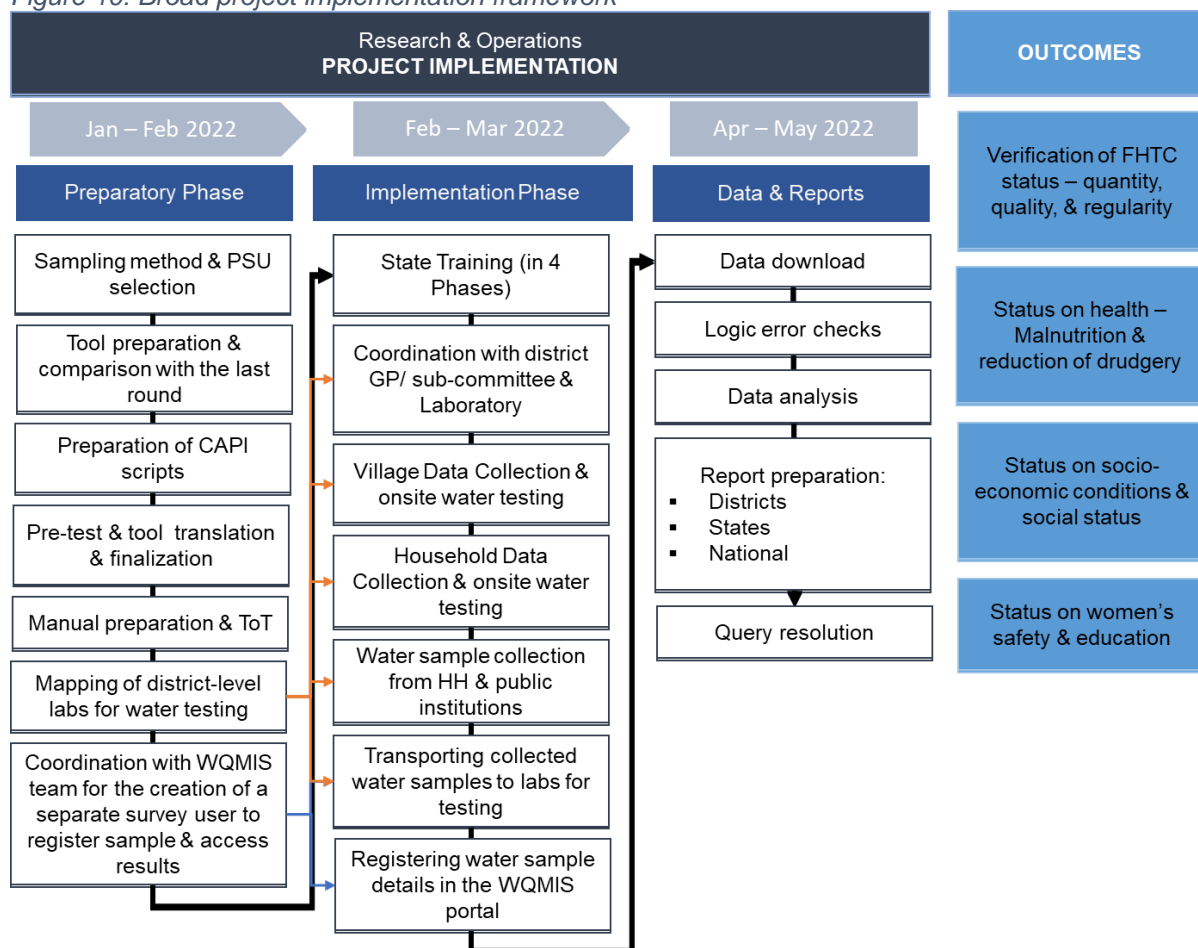


JJM, with the support of the BMI Division of ICMR, enabled a new interface on the WQMIS portal for “Functionality Assessment (FA) User” to enable seamless harmonization of water sample registration, and sample submission for testing, and sharing of results as per the applicable quality parameters.

## 2.8. Project Implementation

An overview of the project implementation is as presented:

Figure 10: Broad project implementation framework



A total of 10 teams (comprising 10 supervisors, 60 assessors, and 10 water collection assistants) were recruited, trained, and deployed to complete the survey across the states of Gujarat. One survey team covered approximately 2 – 3 districts. The state-wise team deployment and fieldwork dates were as presented:

Table No. 1: Team deployment and data collection start & end dates

States	Teams deployed	Start date	End date	Total data collection days
Gujarat	10 Teams	15 <sup>th</sup> February	25 <sup>th</sup> March	35 Days

A four-tier quality control (QC) system was put in place. At the ground level, the data collection exercise was done using a computer-aided Personal Interview (CAPI) application which contained all logic and skip-checks inbuilt. Also, 5% of the total samples were accompanied by the supervisors. Sub-targeted QC was done by the state field managers (5%) and the central project management team (5%). Apart from this, the central research team monitored the data trend and as per requirement debriefed data collection teams to improve quality.

## 2.9. Sample coverage

<b>Table No. 2: Sample covered</b>							
State	Targeted sample			Achieved sample			
	District	Village	HH	District	Village	HHs	PIs
<b>India</b>	<b>712</b>	<b>13,300</b>	<b>3,00,000</b>	<b>712</b>	<b>13,299</b>	<b>3,01,389</b>	<b>16,148</b>
<b>Gujarat</b>	<b>33</b>	<b>384</b>	<b>13,104</b>	<b>33</b>	<b>385</b>	<b>13,716</b>	<b>1,019</b>

## 2.10. Sampled village and household profile

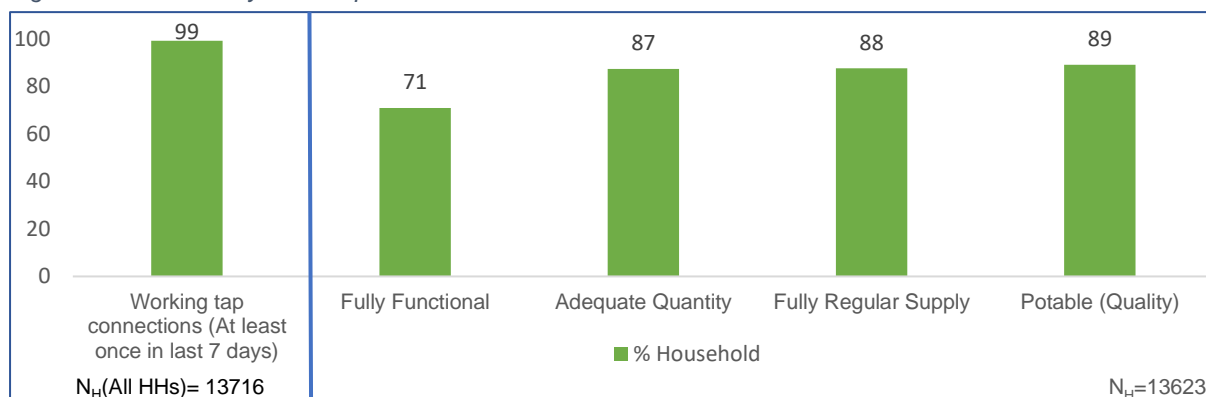
SAMPLED VILLAGES	SAMPLED HOUSEHOLDS
<ul style="list-style-type: none"> <li>Total no. of villages covered in the state – <b>385</b></li> <li>Percentage of SC dominated villages covered in the State is <b>0.5%</b> (while at national level the average is <b>12.6%</b>)</li> <li>Percentage of ST dominated villages covered in the State is <b>25.0%</b> (while at national level the average is <b>20.2%</b>)</li> <li>Higher proportion of <b>Sarpanch</b> interviewed at the village level</li> <li><b>6.2%</b> of the villages reported to have any historical incidence of water contamination</li> </ul>	<ul style="list-style-type: none"> <li>Total no. of households covered in the state – <b>13716 (Respondents: Male 8200, Female 5511 &amp; Transgender 5)</b></li> <li>Proportion of General – <b>25.3%</b>, SC <b>9.0%</b>, ST <b>23.5%</b>, OBC <b>42.1%</b> households</li> <li><b>59.8%</b> of the FHTC connections are under the name of a female member</li> <li>Average household size – <b>5.3</b></li> <li><b>100%</b> positive user experience in 5/5 measures</li> </ul>

### 3. Findings

#### 3.1. Functionality status of FHTC at household level

##### A. Overall Functionality\* (in %)

Figure 11: Functionality of HH tap connection



\* Fully Functional has been computed as = Adequate Quantity  $\cap$  Fully Regular Supply  $\cap$  Potable (Quality)

Please note: Henceforth, N<sub>H</sub>=13623 implies all HHs where water was found on the day of the survey.

It has been found that 99 percent of the sampled HHs (N=13623) had working tap connections. Moreover, more than 4 out of 5 households (87 percent) received adequate ( $\geq 55$  LPCD) water supply and more than 4 out of 5 received regular supply (88 percent) of water. The on-site testing and lab test results of the water indicates that only about 9 out of 10 (89%) of the sampled households in the state receive potable water.

Out of the 13716 HHs sampled for the FHTC assessment, water quantity and quality test was carried out in 13623 due to non-availability of water in 1 percent HHs on the day of survey.

S. No.	District	Working tap connections for 7 days preceding the survey (%HH)	Quantity $\geq 55$ LPCD (% HH)	Regularity (% HH)	Potability# (% HH)
1.	Jamnagar	100	91	91	99
2.	Devbhoomi Dwarka	100	37	40	89
3.	Rajkot	100	92	85	99
4.	Morbi	100	86	88	99
5.	Surendranagar	100	92	95	98
6.	Bhavnagar	100	62	70	99
7.	Botad	100	71	83	99
8.	Amreli	100	81	93	61
9.	Junagadh	100	89	92	97
10.	Gir Somnath	100	66	80	91
11.	Kachchh	100	83	96	100
12.	Banas Kantha	100	96	99	83
13.	Sabar Kantha	100	90	93	99
14.	Aravalli	100	85	94	97
15.	Mahesana	100	99	98	74
16.	Gandhinagar	100	91	97	88
17.	Ahmedabad	100	97	90	96
18.	Kheda	100	97	92	94
19.	Mahisagar	100	83	89	72

Table No. 3: Quantity, Regularity, and Quality of FHTC at the district level (%HH)					
S. No.	District	Working tap connections for 7 days preceding the survey (%HH)	Quantity >=55 LPCD (% HH)	Regularity (% HH)	Potability# (% HH)
20.	Vadodara	100	99	97	74
21.	Chhotaudepur	100	96	100	98
22.	Bharuch	100	99	93	75
23.	Surat	100	100	85	100
24.	Tapi	100	100	65	99
25.	Valsad	100	93	98	99
26.	Dang	100	96	100	99
27.	Patan	100	99	97	99
28.	Porbandar	100	92	87	90
29.	Anand	100	98	99	84
30.	Dohad	100	42	33	99
31.	Narmada	100	95	90	2
32.	Navsari	100	96	99	98
33.	GUJARAT	99	87	88	89
34.	Panch Mahals	77	94	89	96
# Potable water has been considered basis testing of water samples through laboratory tests for physical, chemical, and bacteriological as given in Table 5 parameters (within acceptable/ permissible range) and onsite testing of pH. The details of laboratory test are mentioned in the table given above in the glossary.					
JE-AES Affected		Aspirational Districts	Aspirational & JE-AES Affected		

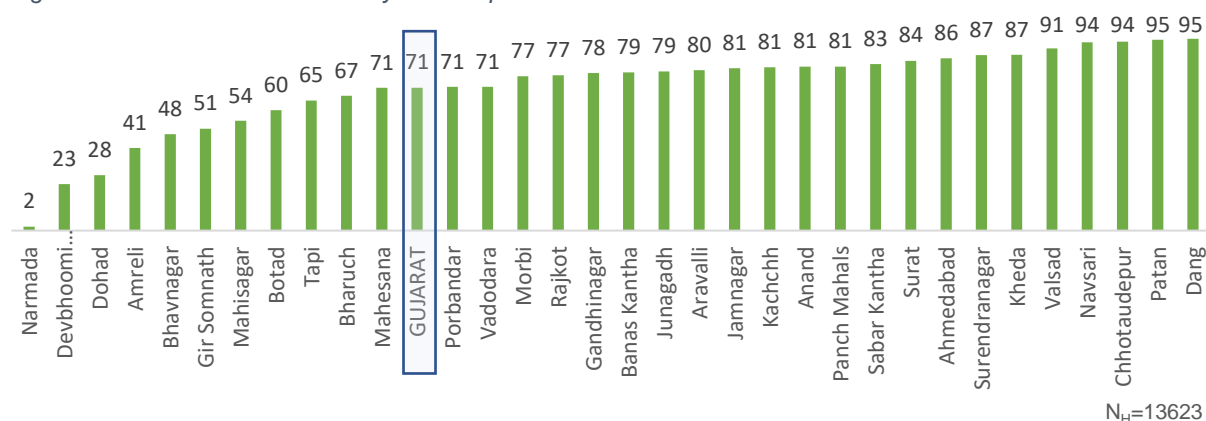
District level comparison across the districts indicate that Panch Mahals reported functionality less than the state average. The districts of Dohad, Panch Mahals, Valsad, Porbandar, Mahisagar, Gandhinagar, Aravalli, Sabar Kantha, Gir Somnath, Kachchh, Junagadh, Amreli, Botad, Bhavnagar, Surendranagar, Morbi, Rajkot, Jamnagar, and Devbhoomi Dwarka FHTC provide more than 55 LPCD of water in less than 95 percent HHs.

More than 95 percent HHs in the districts of Kachchh, Banas Kantha, Mahesana, Gandhinagar, Vadodara, Chhotaudepur, Valsad, Dang, Patan, Anand, and Navsari reported to regularly receive water through FHTC. Regular supply of water is less than 50 percent in the districts of Dohad, and Devbhoomi Dwarka.

Potability of water was found to be 100 percent in the districts of Surat and Kachchh. Whereas in the districts of Narmada the potability of water was found less than 10 percent.

## B. District wise functionality status

Figure 12: District wise Functionality of HH tap connection



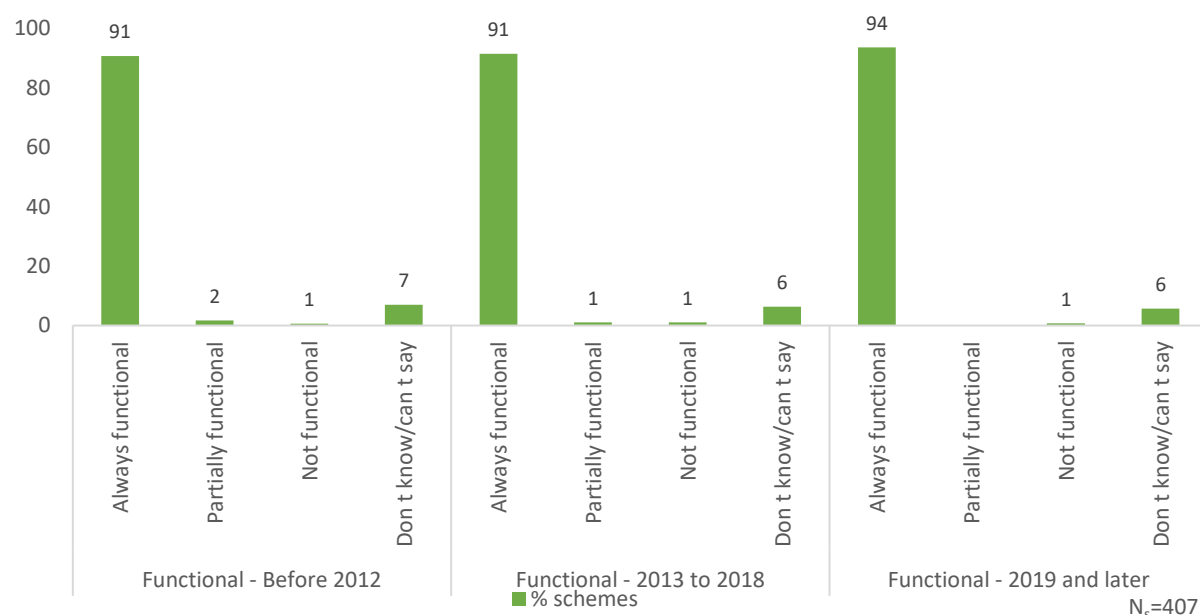


\* 'Functionality' has been computed as the intersection of Adequate Quantity, Fully Regular Supply and Potable (Quality) for households wherein water supply was available at the time of survey, i.e., 13623 HHs.

**71 percent HHs** in the state were found to have functional HH tap water connection. Dang and Patan district reported 95 percent functional households in the state, followed by Valsad, Navsari, and Chhotaudepur with more than 90 percent functionality. In the districts of Narmada, Devbhoomi Dwarka, and Dohad with less than one-third of the households have functional HH tap water connection highlighting scope for improved service delivery.

### C. Age vs functionality of schemes in the villages

Figure 13: Age vs functionality of schemes in the villages



More than 9 out of 10 schemes are functional since 2012 which reflects no change in till 2018 and 3-point increase in 2019 and later.

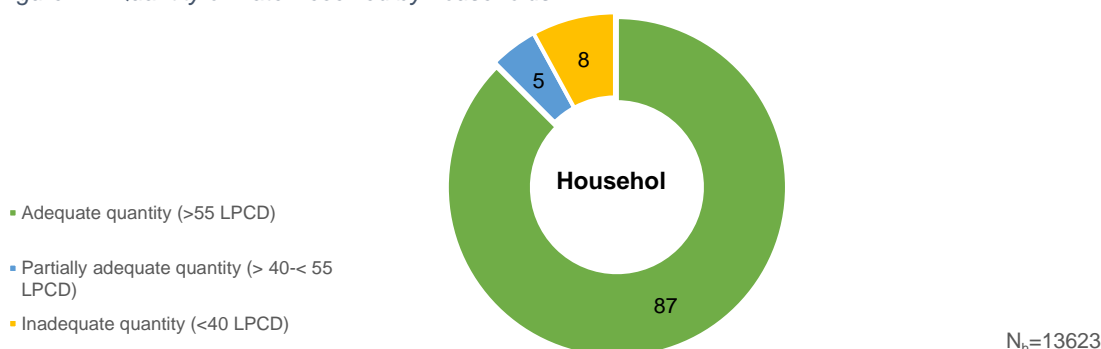
### 3.2. Quantity, Regularity, and Quality of Water

Under JJM, functionality is defined as having infrastructure, i.e., household tap connection providing water in adequate quantity (55 LPCD or more) of prescribed quality on regular basis (every day or as decided by GP and/ or its sub-committee) with adequate pressure. It also includes long-term source and system sustainability. For the purposes of this survey, the quality parameters are defined and measured on a set of 15 indicators (of which 2 indicators are tested on-site and for 13 indicators water samples have been sent to the laboratories), as mentioned in the glossary section.

#### A. Water quantity measured as LPCD (Litres per Capita per Day)

**87% HHs** reported receiving more than 55 LPCD of water.

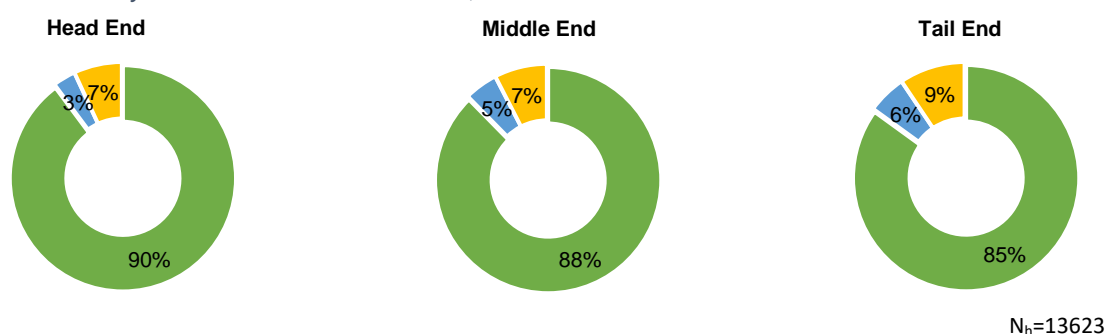
Figure 14: Quantity of water received by households



Water quantity in the households has been calculated in 13623 due to non-availability of water in 1 percent HHs on the day of survey.

#### Quantity of water received across head, mid, and tail end

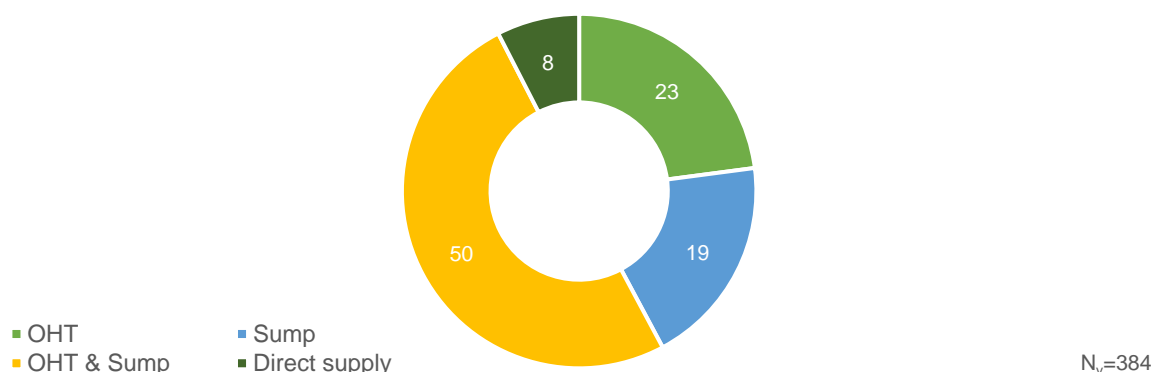
Figure 15: Quantity of water received across head, middle and tail end households



The quantity of water received across the head, middle, and the tail end was observed to have declined, and about four-fifth (79%) of the sampled households received water in adequate quantity, i.e., greater than or equal to 55 LPCD.

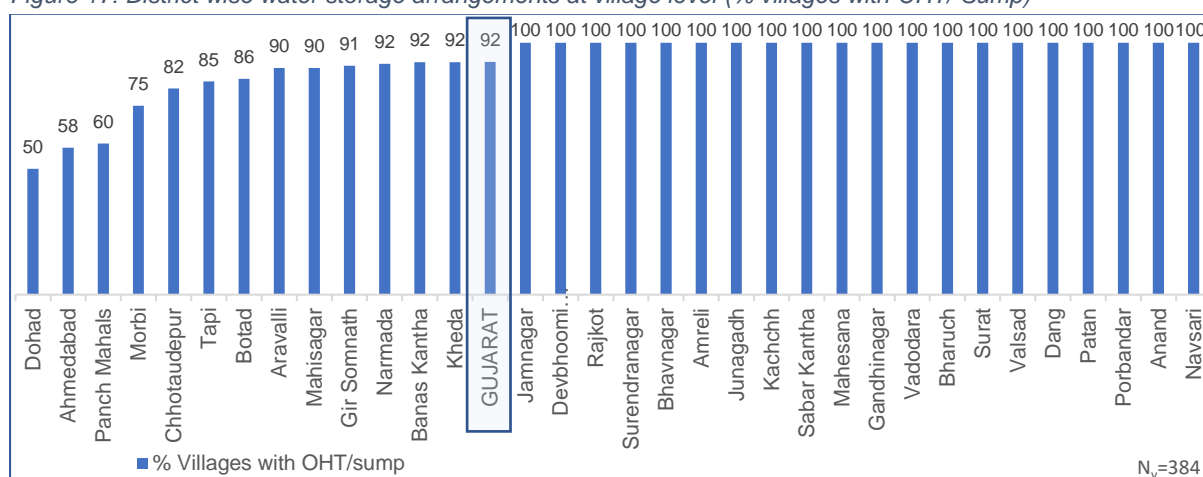
### Types of water storage arrangements at village level (in %)

Figure 16: Pipe water supply storage available in village



Less than one out of ten respondents in the state reported water being directly supplied. And in 50 percent reported water being stored in sump and overhead tanks.

Figure 17: District wise water storage arrangements at village level (% villages with OHT/ Sump)

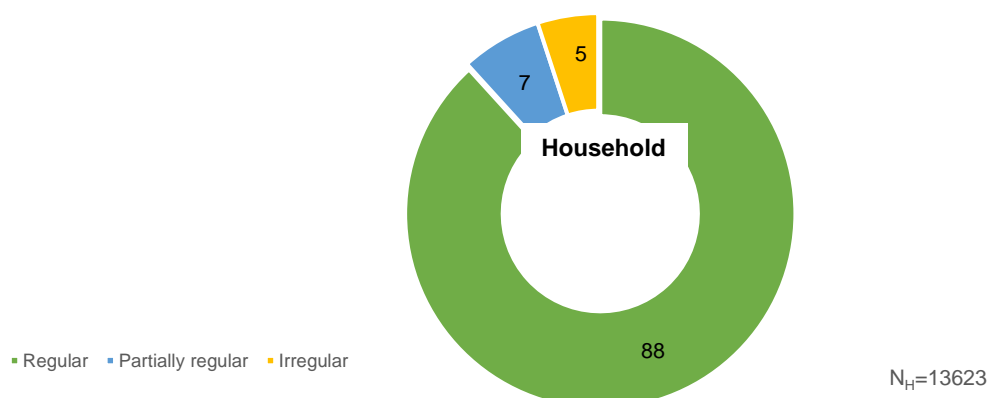


**92 percent villages** in the state have either an OHT or a sump for storing water for supplying to the households. In most of the districts, all the villages have either an OHT or a sump. Dohad is the district where this figure is the lowest (50%).

## B. Regularity of water supply to households

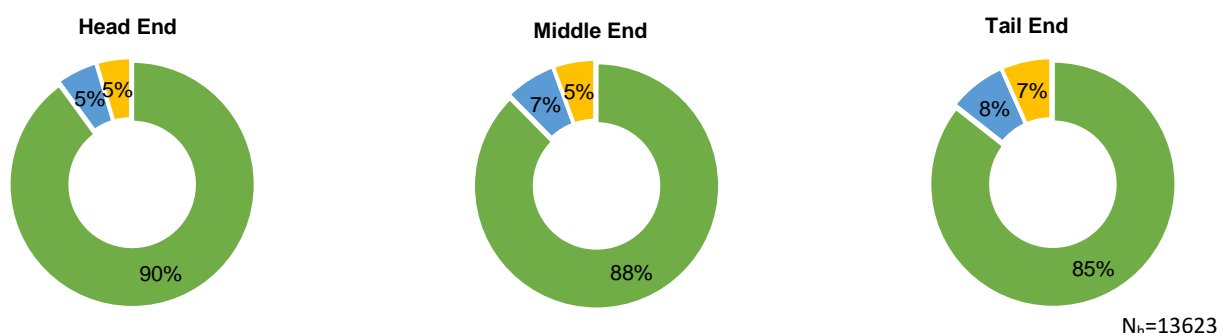
**88% HHs** receive a regular supply of water (as per agreed schedule).

Figure 18: Regularity of water received by households



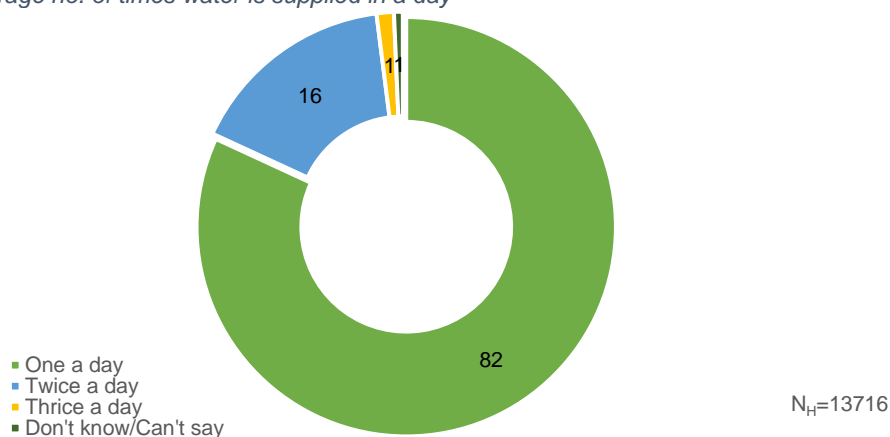
### Regularity of water received across head, mid, and tail end

Figure 19: Regularity of water received across head, middle and tail end households



Water is more regularly available at the head-end households of the PWS in comparison to the tail end.

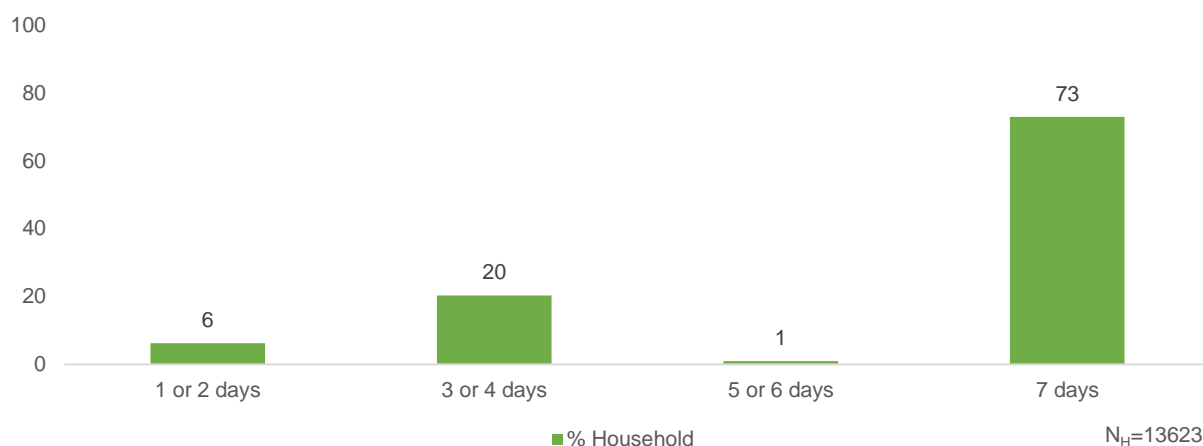
Figure 20: Average no. of times water is supplied in a day



HHs in **82% of districts** receive water once a day. The average duration of water supply across the state was reported to be **3 hours per day**.

### Average water supply days in a week to households

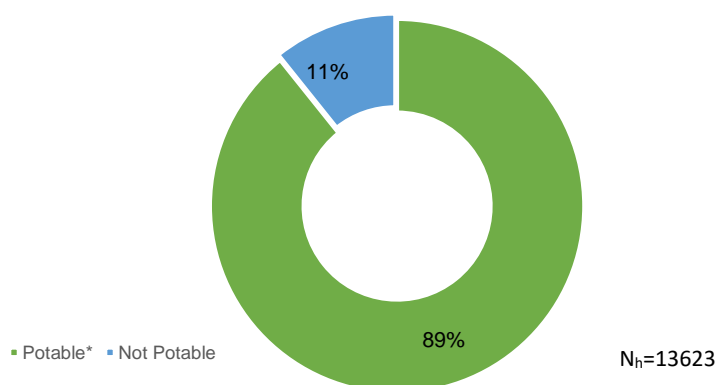
Figure 21: Average number of days households receive water supply in a week (in %)



**73 percent** of the households reported receiving water for all 7 days in a week (daily).

### C. Water quality – Potability

Figure 22: Potable water received by households



*\*Potable water has been considered basis testing of water samples through laboratory tests for physical, chemical and bacteriological as given in Table 5 parameters (within acceptable/ permissible range) and onsite testing of pH. The details of laboratory test are mentioned in the table given above in the glossary.*

Among the sampled households in Gujarat where water was found on the day of the survey, the potability of water was found to be 89%.

**Table No. 4: Village quality parameters reported within permissible range (% sample within permissible range)**

Quality Parameters (N <sub>v</sub> =384)	AWC	HF	Others	Schools
pH (on-site)	99	96	100	98
Residual Chlorine (on-site)	46	51	40	42
Turbidity	100	100	100	100
Total Hardness	99	96	95	99
Total Alkalinity	99	98	100	97
Chloride	100	98	100	100
Ammonia	Not tested			
Iron	Not tested			
Nitrate	94	97	95	93
Sulphate	100	100	100	100
Total Dissolved Solids	100	98	99	98
Bacteriological Test (Absence)	98	100	96	95
Fluoride	99	98	99	100
Arsenic (In Hotspots)	Not tested			

**Table No. 5: Household water quality parameters reported within permissible range (in % sample within permissible range)**

The number of water samples submitted to the laboratory for the calculation of the different parameters was the same as mentioned in the rest of the report (sample size for HH water submitted to labs=13623). However, the below data are presented based on the results received from the laboratories and the respective base sizes are mentioned for each of the parameters separately.

Quality Parameters	No of water samples tested	% Samples within permissible range
pH (on-site)	13716	98
Turbidity	13202	100
Total Hardness	12995	98
Total Alkalinity	13194	99
Chloride	13165	100
Ammonia	Not Tested	
Iron	Not Tested	
Nitrate	13118	94
Sulphate	13047	100
Total Dissolved Solids	13147	99
Bacteriological Test (Absence)	13069	97
Fluoride	13144	99
Arsenic	Not Tested	



## Safeguarding piped water supply for unforeseen bacteriological contamination- Presence of Residual Chlorine (RC)

The Residual Chlorine (RC) in the state of Gujarat was found in 50% samples. Also, 5% samples were having RC outside range and 45% samples, had no RC. 97% of water samples passed the bacteriological contamination test. While in 3% samples bacteriological contamination is found, but there was no chlorination.

The Residual Chlorine in piped water supply is one of the most important preventive actions to assure quality of water against bacteriological contamination from source to consumption. The presence of residual chlorine within permissible limits is indicator of well-maintained and healthy piped water supply system.

It is advised that behavioural change communication campaigns on appropriate dosage of residual chlorine is held in all villages and monitoring system for chlorine dosing is established. The FTK must have residual chlorine testing facility for effective WQM&S.

### Comment on functioning of District Lab:

The district lab tested water samples for 11 water quality parameters. 14641 water samples were submitted, and 14334 water samples were tested, and reports made available. The turnaround time for testing was more than 48 hours in most cases. Given this feedback, it can be conferred that these labs have limited scope to take up samples from the general public at large on a regular basis.

Table No. 6: Performance of Labs						
Sl. No	District	Lab available	HH surveyed	Samples submitted	Report received	Overall lab experience
1	Jamnagar	Yes	474	496	474	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
2	Devbhoomi Dwarka	Yes	412	422	420	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
3	Rajkot	Yes	416	437	416	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
4	Morbi	Yes	421	450	450	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
5	Surendranagar	Yes	399	446	438	The labs did not have any issue with testing the number of water samples submitted nor had any issues with

<b>Table No. 6: Performance of Labs</b>						
<b>Sl. No</b>	<b>District</b>	<b>Lab available</b>	<b>HH surveyed</b>	<b>Samples submitted</b>	<b>Report received</b>	<b>Overall lab experience</b>
						human resource, reagents etc
6	Bhavnagar	Yes	392	413	412	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
7	Botad	Yes	405	437	432	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
8	Amreli	Yes	390	408	401	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
9	Junagadh	Yes	448	491	448	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
10	Gir Somnath	Yes	389	407	406	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
11	Kachchh	Yes	447	501	486	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
12	Banas Kantha	Yes	407	449	448	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
13	Sabar Kantha	Yes	398	437	434	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
14	Aravalli	Yes	408	438	428	The labs did not have any issue with testing the number of water samples submitted nor

<b>Table No. 6: Performance of Labs</b>						
<b>Sl. No</b>	<b>District</b>	<b>Lab available</b>	<b>HH surveyed</b>	<b>Samples submitted</b>	<b>Report received</b>	<b>Overall lab experience</b>
						had any issues with human resource, reagents etc
15	Maheana	Yes	419	464	457	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
16	Gandhinagar	Yes	409	461	418	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
17	Ahmedabad	Yes	436	472	461	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
18	Kheda	Yes	393	438	433	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
19	Mahisagar	Yes	389	398	392	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
20	Panch Mahals	Yes	406	322	322	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
21	Vadodara	Yes	423	432	432	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
22	Chhotaudepur	Yes	409	437	434	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc

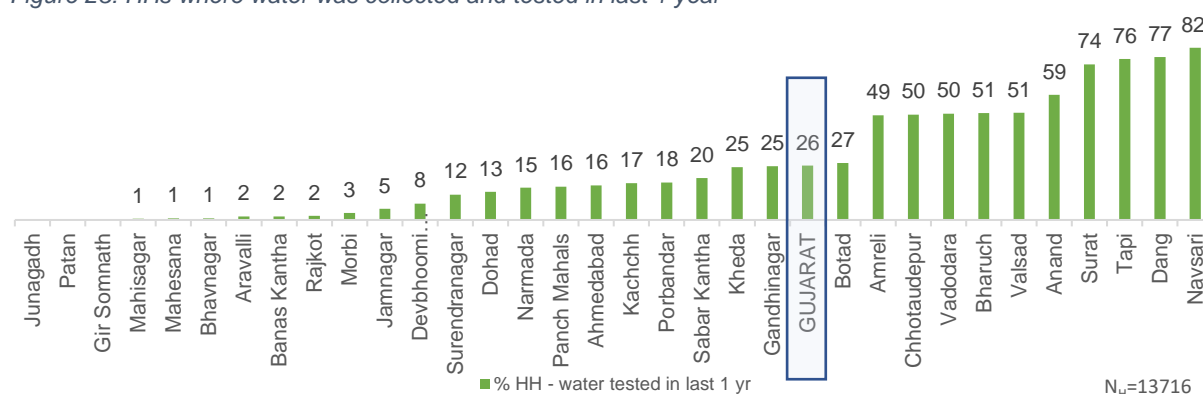
<b>Table No. 6: Performance of Labs</b>						
<b>Sl. No</b>	<b>District</b>	<b>Lab available</b>	<b>HH surveyed</b>	<b>Samples submitted</b>	<b>Report received</b>	<b>Overall lab experience</b>
23	Bharuch	Yes	429	469	443	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
24	Surat	Yes	448	477	461	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
25	Tapi	Yes	403	447	433	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
26	Valsad	Yes	402	443	434	The labs did not have capacity to test more than 40 number of samples and had issues of human resource, reagents etc
27	Dang	Yes	398	426	414	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
28	Patan	Yes	408	456	451	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
29	Porbandar	Yes	433	437	436	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
30	Anand	Yes	457	510	508	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
31	Dohad	Yes	435	448	448	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc

Table No. 6: Performance of Labs						
Sl. No	District	Lab available	HH surveyed	Samples submitted	Report received	Overall lab experience
32	Narmada	Yes	413	430	430	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
33	Navsari	Yes	400	442	434	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc

**Households reported that their HH tap-water was collected and tested in the last one year**

**26% of HHs** reported that their HH tap-water was collected and tested in the last one year.

Figure 23: HHs where water was collected and tested in last 1 year

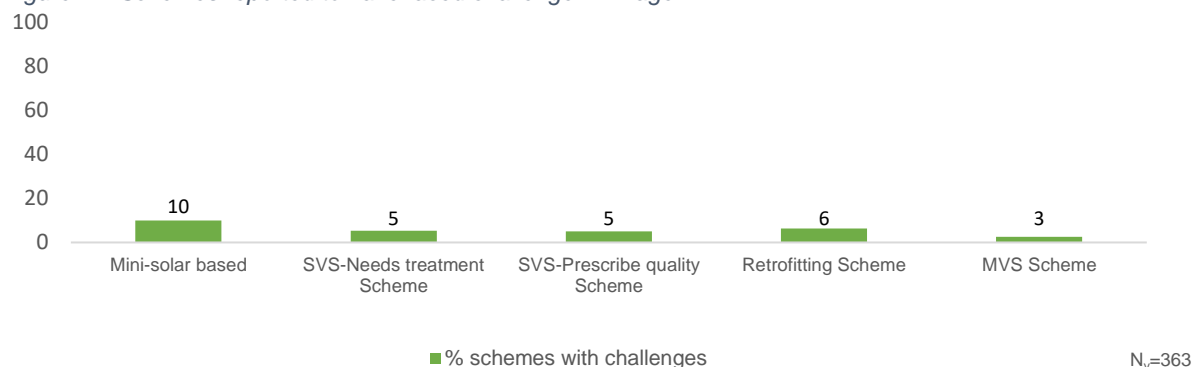


### 3.3. Operation and Maintenance (O&M) of schemes at village level

#### Schemes reported to have faced challenge in village

The mini solar scheme faced the most challenges (10%) in comparison to the other schemes in the state

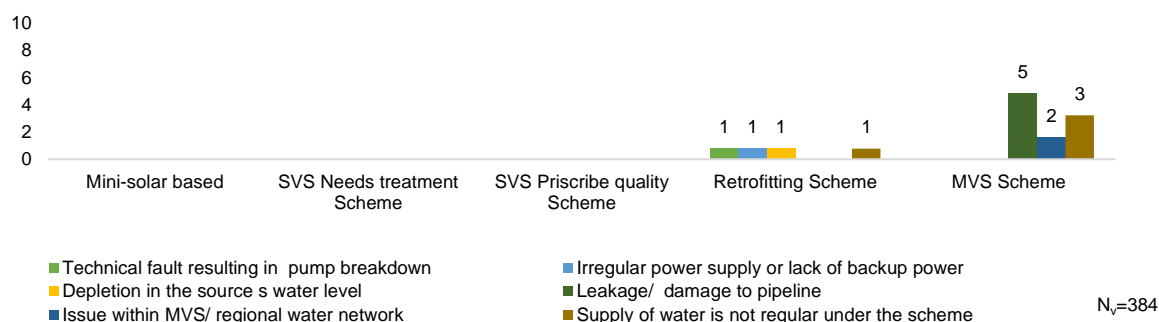
Figure 24: Schemes reported to have faced challenge in village



#### Type of challenge faced by the schemes

The most faced problem varied from one scheme to another. However, 'leakage/damage to pipeline' is a problem that was found unanimously in all the schemes.

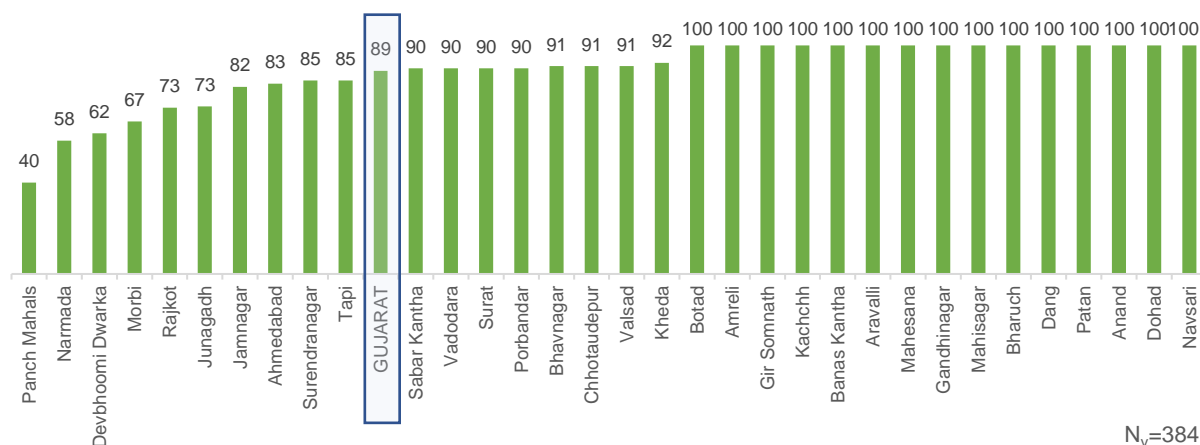
Figure 25: Type of challenge faced by the schemes



#### A. Presence of VWSC/Pani Samiti

89% of villages in the state reported to have a VWSC or a Pani Samiti.

Figure 26: Villages where VWSC/ Pani Samiti is present

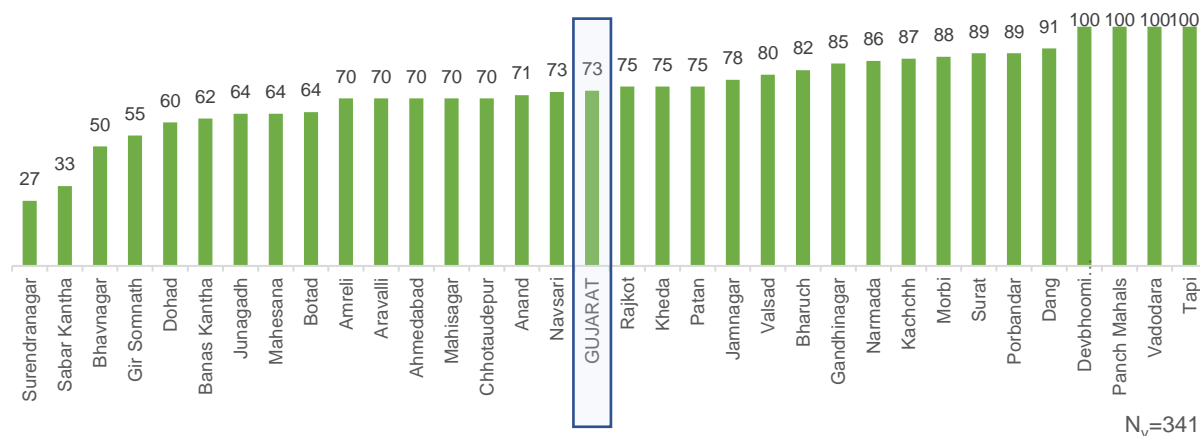




## B. VWSC/Pani Samiti with more than 50 percent female members

**73% of villages** in the state reported to have a VWSC or a Pani Samiti with more than 50% female members.

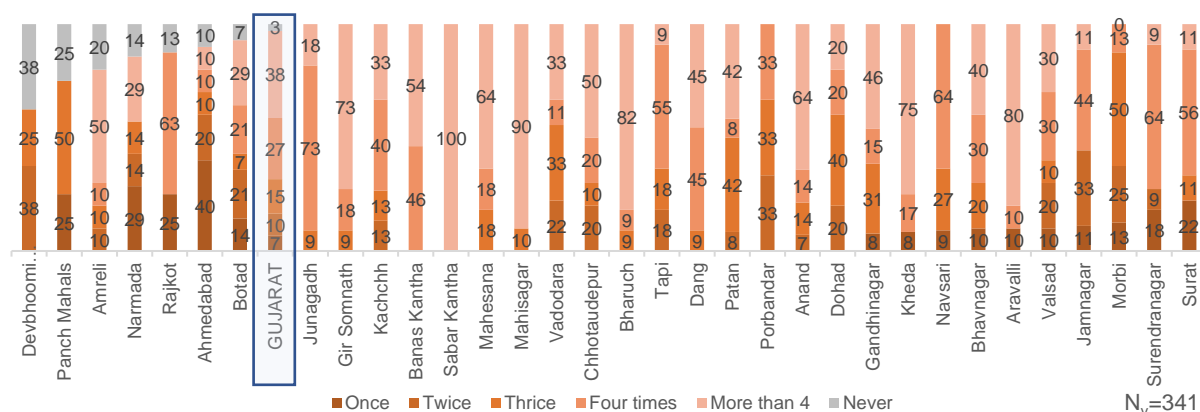
Figure 27: VWSC/ Pani Samiti with more than 50 percent female members



## C. VWSC Meetings in last one year

Across the villages in the state, that reported to have VWSC/Pani Samitis (341 villages), 4 meetings in last one year was reported the most (27%)

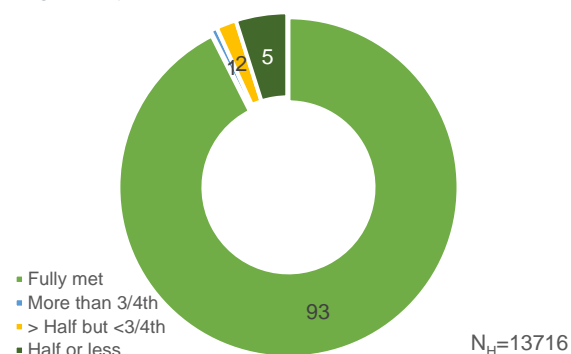
Figure 28: VWSC meetings held in last one year



### 3.4. Utilization of water at HHs for drinking and other activities

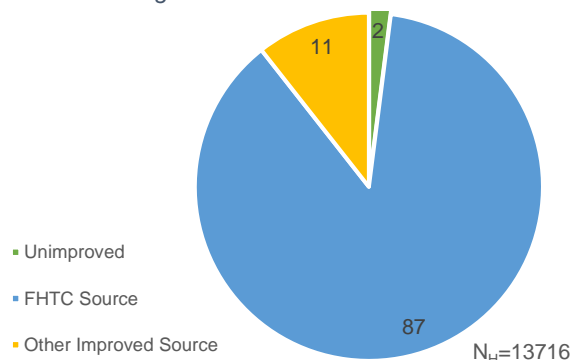
**93% of HHs** reported that their daily requirement of water was being met by HH tap connections

Figure 30: Daily household's requirement of water being met by FHTC



**87% HHs** reported HH tap connections as their primary source of drinking water

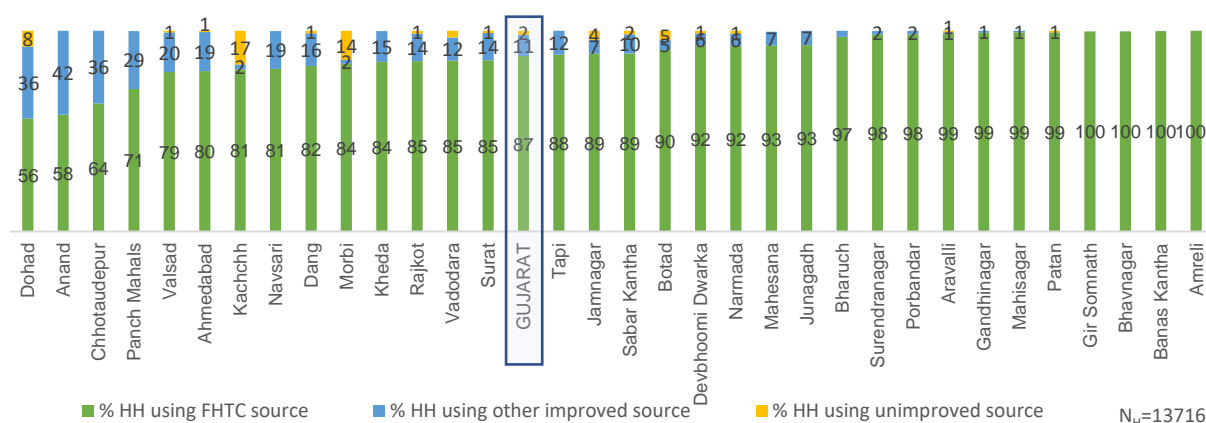
Figure 29: Households reported FHTC as primary source of drinking water



More than 9 out of 10 (93%) HHs reported their daily requirement of water being fully met by the HH tap connections. And 87 percent HHs reported used household tap connection for drinking water (primary source). About 11 percent of the HHs even though have reported household tap connections to fully meet their requirements, were not found using the same for drinking purposes.

Overall, **98% of HHs** reported using improved primary source of drinking water, out of which **87% of HHs** reported HH tap water as their primary source.

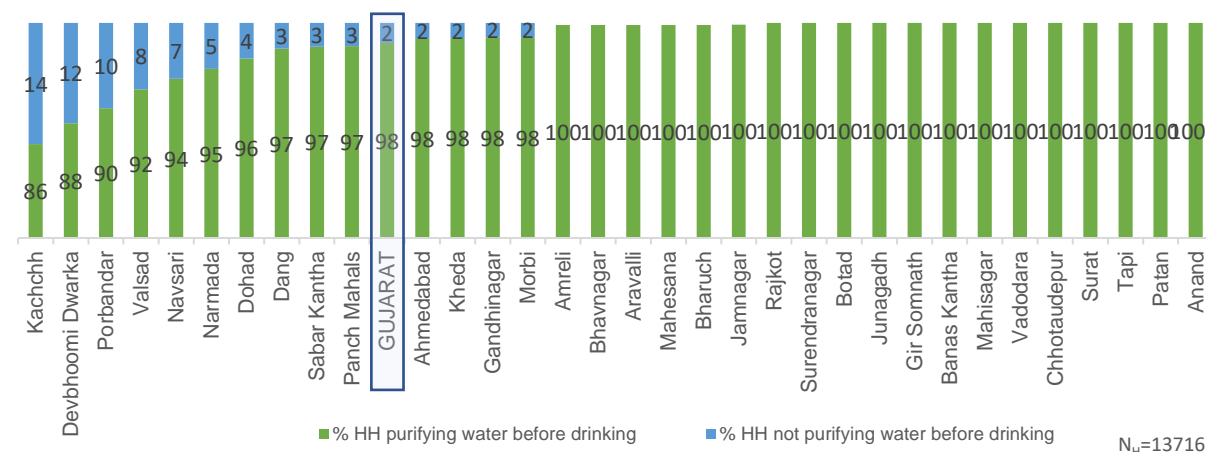
Figure 31: District wise distribution of household's reported FHTC as primary source of drinking water



## A. Households who practice of purifying water before drinking

Practice of purifying water before drinking was reported to be 100 percent in majority of the districts. The least was reported in Kachchh district (86%).

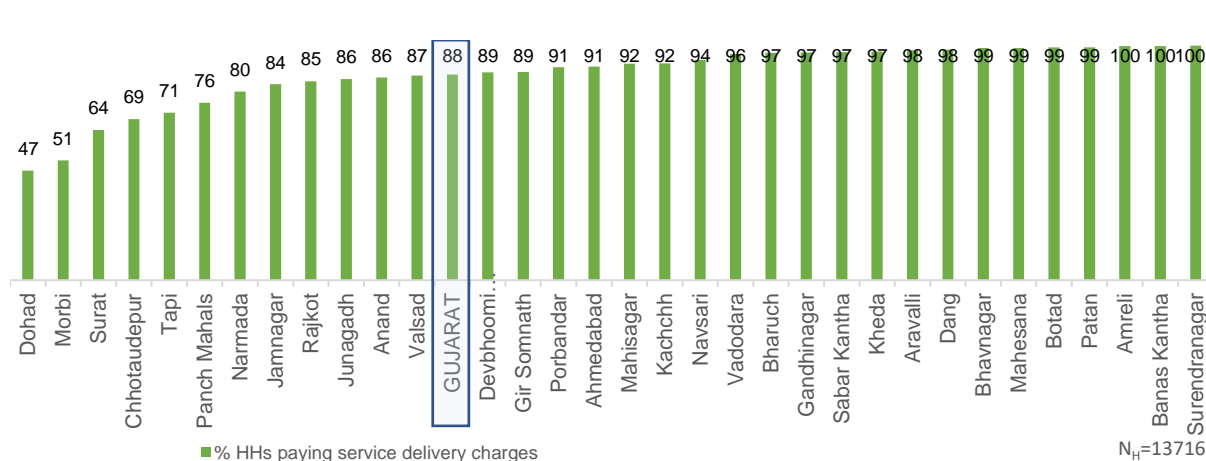
Figure 32: Households who practice of purifying water before drinking



## B. Households paying water service delivery charges

In Gujarat, around 88% of the sampled households were found to be paying service delivery charges, Surendranagar, Banas Kantha, and Amreli being the district with the highest percentage of such households (100%) and Dohad being the districts in which households reported not paying any water service delivery charges.

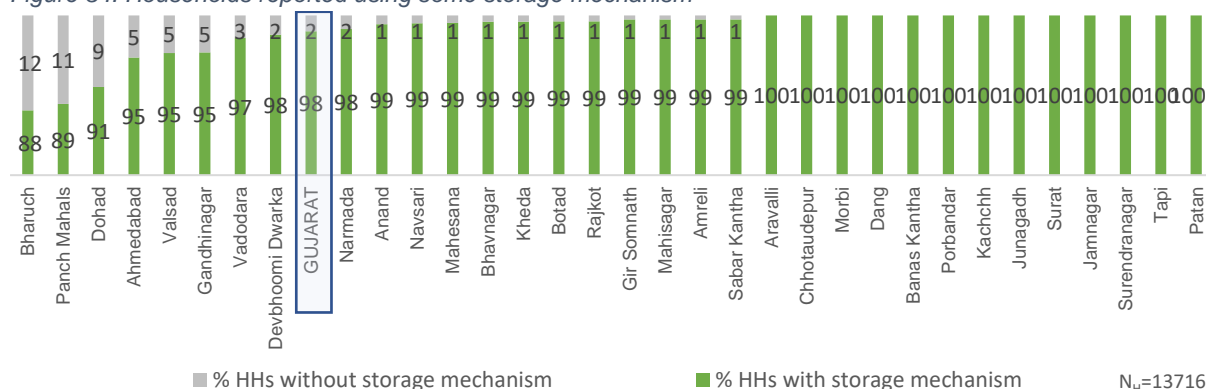
Figure 33: Households paying water service delivery charges



### C. Storage mechanism used by households

Overall, 98 % households in Gujarat were found to use some mechanism to store water in the household

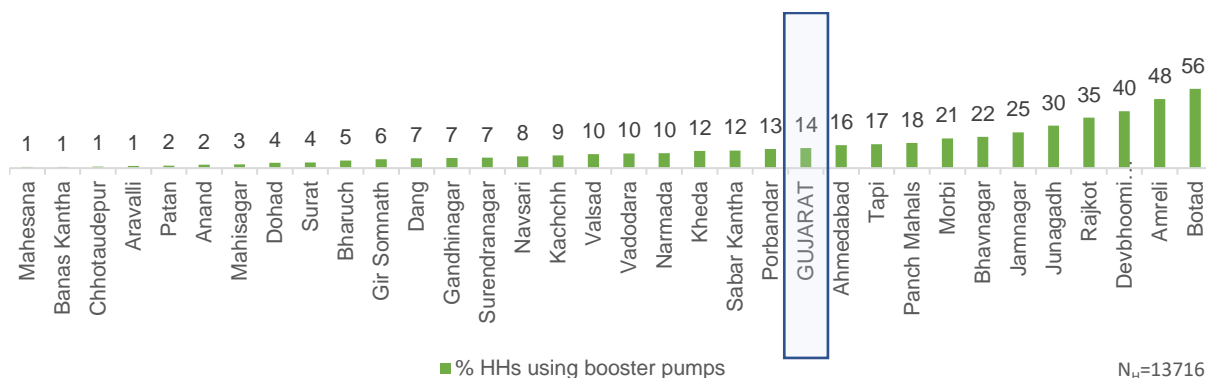
Figure 34: Households reported using some storage mechanism



### D. Households using booster pumps

Overall, **14% HHs** reported using booster pumps to maximize the water flow through their piped water connections. Botad reported 56% of HHs using booster pump in the state while Mahesana, Banas Kantha, Chhotaudepur, and Aravalli reported only 1%.

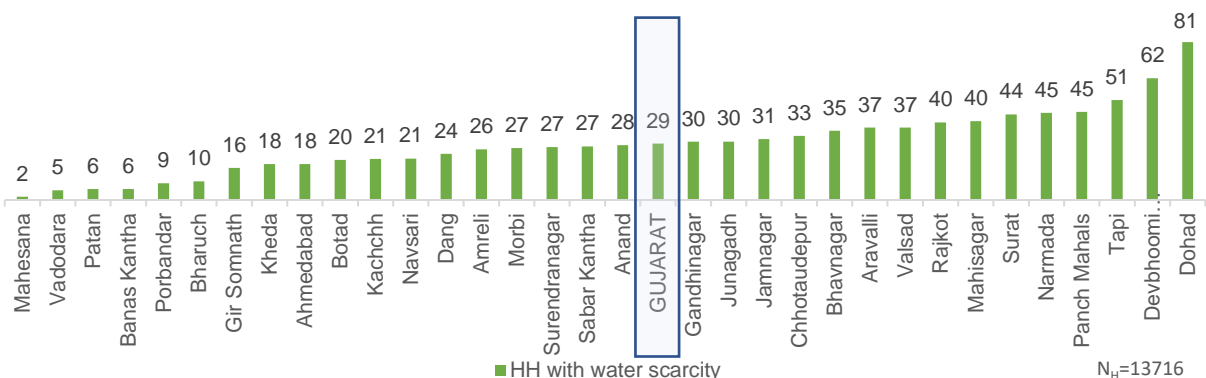
Figure 35: Households reported to use of booster pumps



### E. Households who faced shortage of water

In the state, **29% HHs** faced shortage of water during any time of the year.

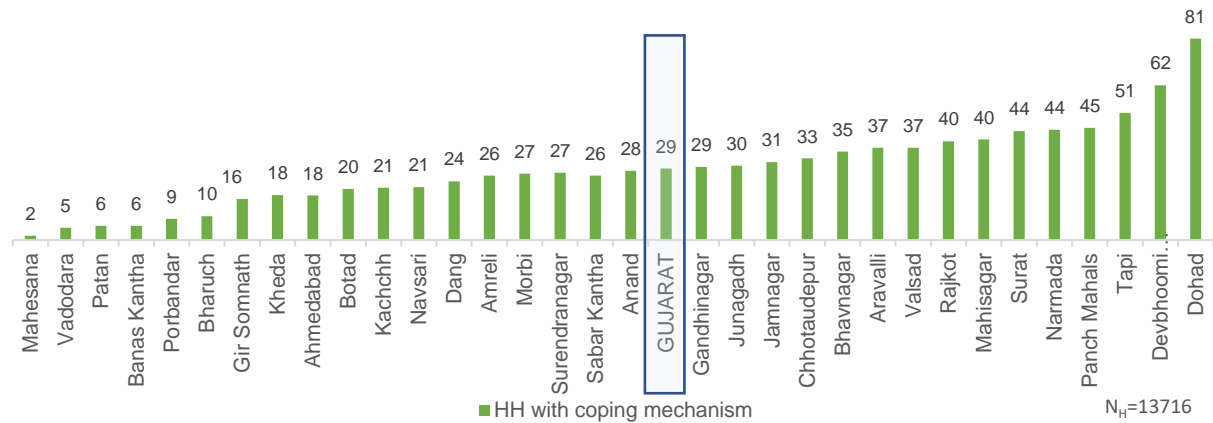
Figure 36: Households who faced water scarcity



## F. Households with coping mechanism during scarcity of water

In the state, **28% HHs** reported having some mechanism to cope with scarcity of water.

Figure 37: Households reported to have some mechanism to cope with scarcity of water

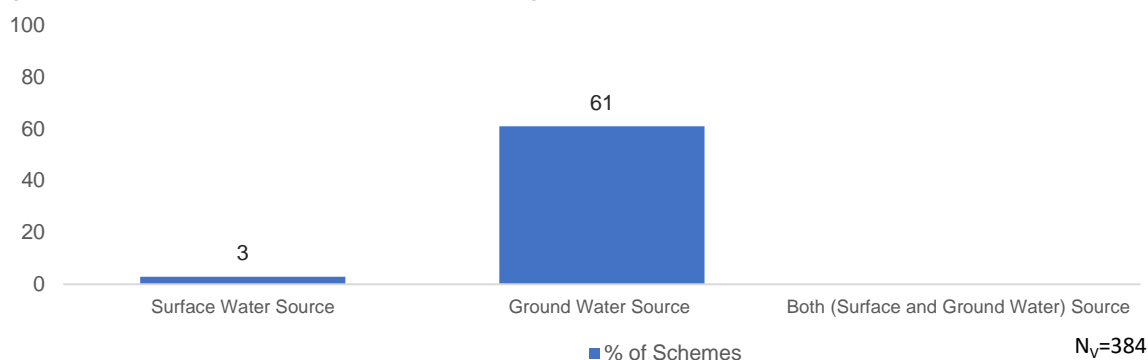


### 3.5. Source sustainability at the village level

#### Schemes based on surface and ground water

3% of schemes reported to be based on surface water source while 61% of schemes reported to be based of ground water sources.

Figure 38: Schemes based on water source in village

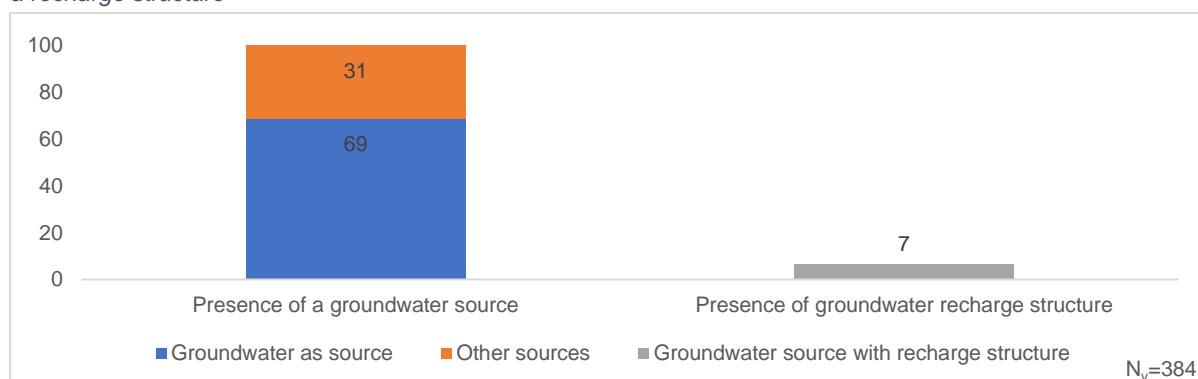


\*'Surface Water Source' is Stream, Spring, Glacier, River, lake, pond etc. and Groundwater Source is open well, borewell, tube well, handpump, spring, etc.

#### Villages reported having presence of a groundwater source

In the state, **69% villages** reported the presence of groundwater sources like improved dug wells and borewells. Out of which, 7 percent of villages reported (i.e., 25 villages) reported having a recharge structure.

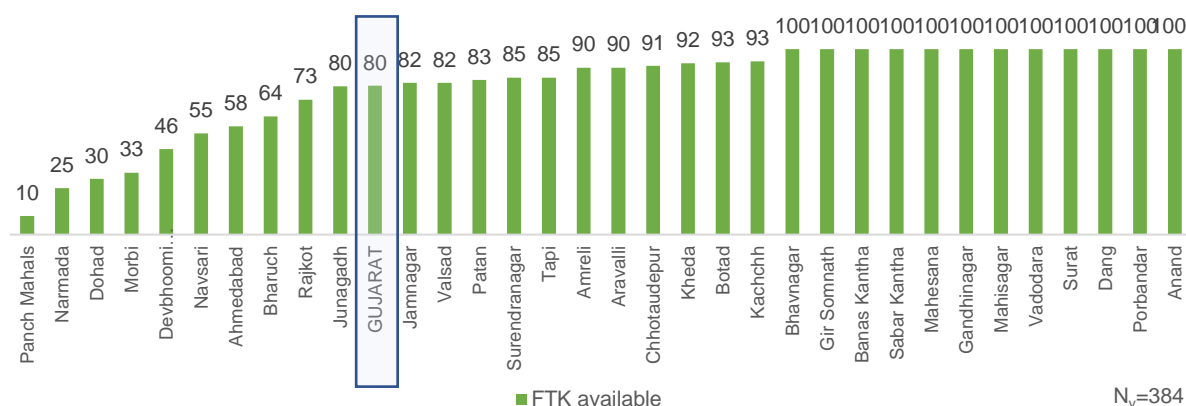
Figure 39: Villages reported the presence of groundwater sources and among those how many reported to have a recharge structure



### 3.6. Water quality monitoring and surveillance in the villages

#### A. Water quality management by VWSC: Availability of FTK with the Pani Samiti/ VWSC

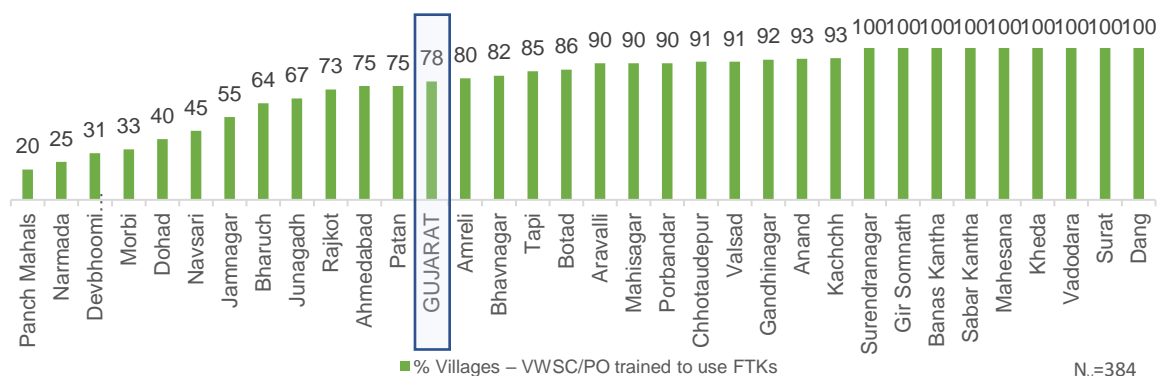
Figure 40: Availability of field test kits with VWSC/ Pani Samiti



With regards to water quality testing in the village by VWSC, 80% villages in the state reported having available field test kits. Only 10 percent of the villages in Panch Mahals reported to have FTKs available with the Pani Samiti/VWSC.

#### B. Persons trained to use field test kits

Figure 41: Persons trained to use field test kits



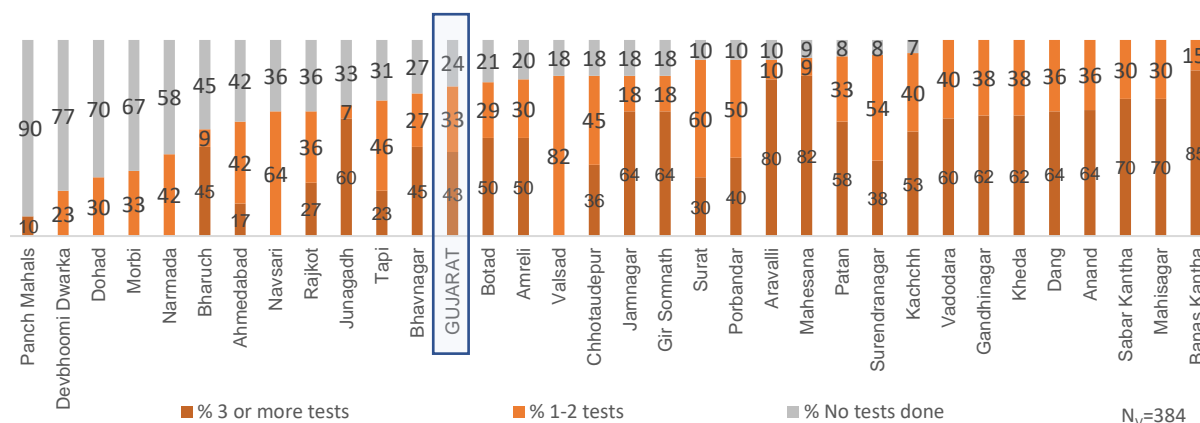
Overall, **78% of villages** in the state reported to have either VWSC/Pani Samiti or pump operator trained to use field test kits for testing the quality of water on-site. This figure was the least in Panch Mahals district.



### C. Water quality management by VWSC: Frequency of testing using FTK

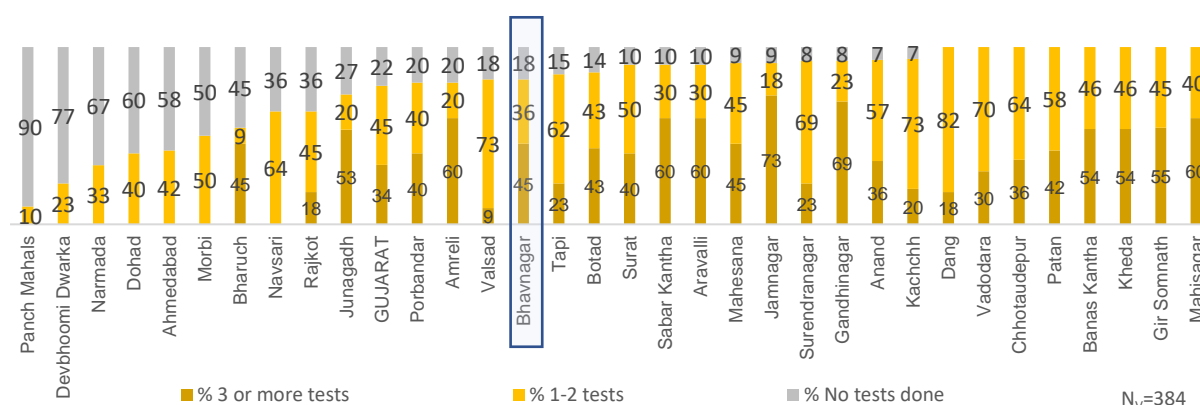
Across the state, more than 40 percent of the total sampled villages (43%) reported that the quality of water (at different points in the respective villages) was checked at least three times using FTKs in last one year. Among the districts, Banas Kantha had the highest proportion of such villages, wherein 85% of its villages reported using FTKs three or more times in last one year.

Figure 42: Frequency of testing using FTK in villages



### D. Water quality management by VWSC: Frequency of lab testing

Figure 43: Frequency of lab testing

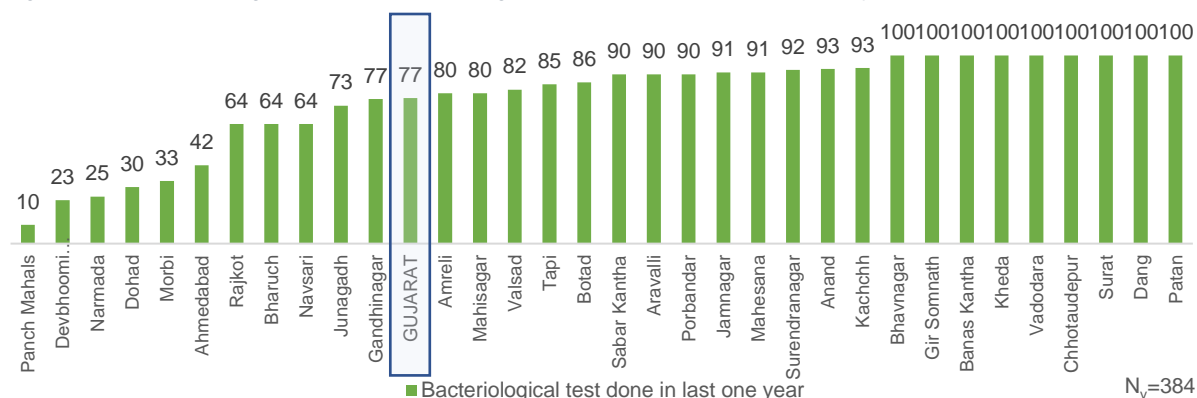


Across the state, more than one-third of the total sampled villages (34%) reported that the quality of water (at different points in the respective villages) was checked at least three times through laboratories in last one year. Among the districts, Jamnagar had the highest proportion of such villages, wherein 73% of its villages reported tests through laboratories - three or more times in last one year.

### E. Water quality management by VWSC: Bacteriological test done in last one year

With regards to water quality testing in the village by VWSC, **77% villages** in the state reported having bacteriological test done in the last one year.

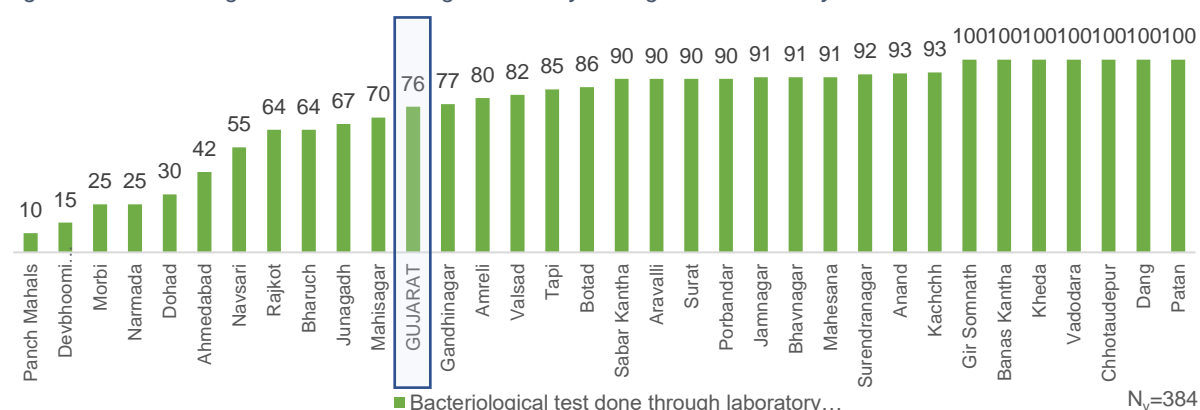
Figure 44: Percent villages in which Bacteriological test was done in the last one year



### F. Water quality management by VWSC: Bacteriological test done through laboratory testing in the last one year

Laboratory based bacteriological tests, in last one year, was reported by 76% of sampled villages. All sampled villages from the districts Gir Somnath, Banas Kantha, Kheda, Vadodara, Chhotaudepur, Dang, and Patan reported to have had bacteriological tests done through laboratories in last one year.

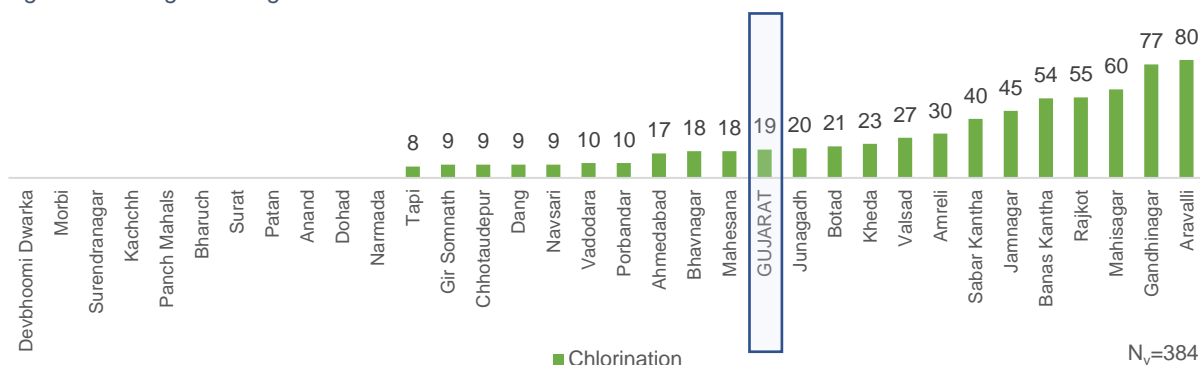
Figure 45: Bacteriological test done through laboratory testing in the last one year



### G. Water quality management by villages: Availability of chlorination mechanism in the village

More than **19% villages** reported that there is availability of chlorination mechanism in the village.

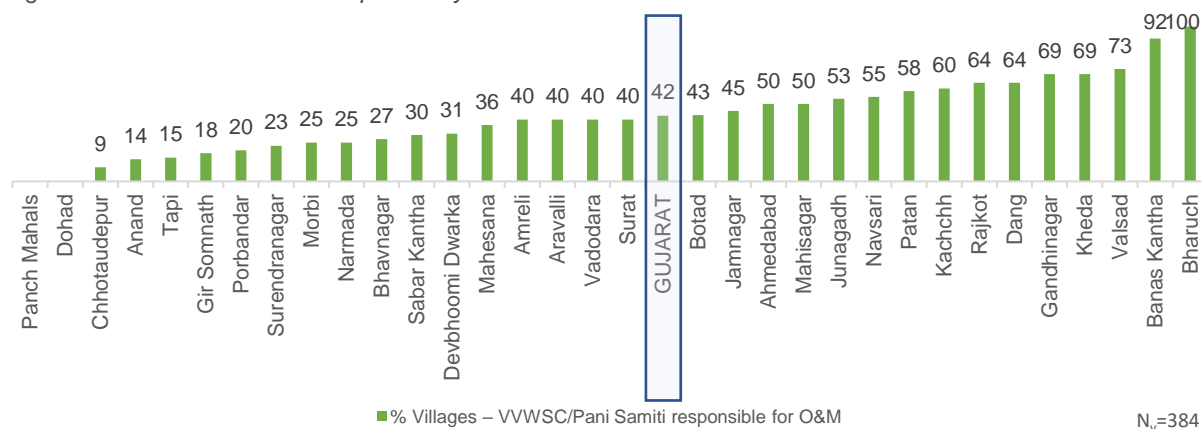
Figure 46: Villages having a mechanism for chlorination



### 3.7. Management of water service delivery at village level

#### A. VWSC/Pani Samiti responsibility for O&M of PWS schemes

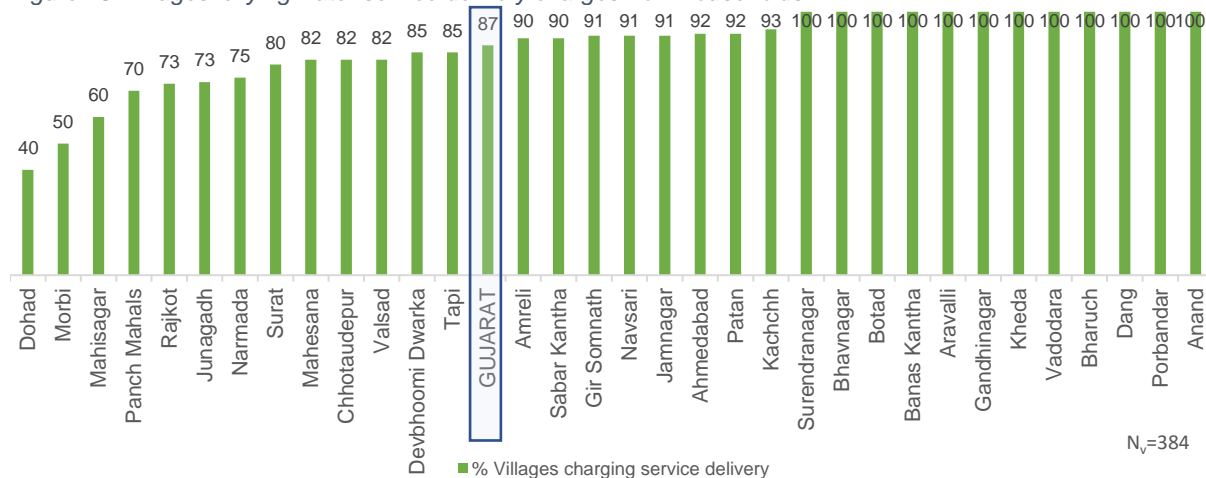
Figure 47: VWSC/Pani Samiti responsibility for O&M of PWS schemes



In the state, **42% villages** that have VWSC/Pani Samiti reported to be responsible for operation and maintenance of PWS. Panch Mahals and Dohad districts reported that VWSC/Pani Samiti are not responsible for operation and maintenance of PWS.

#### B. Villages levying water service delivery charges from households

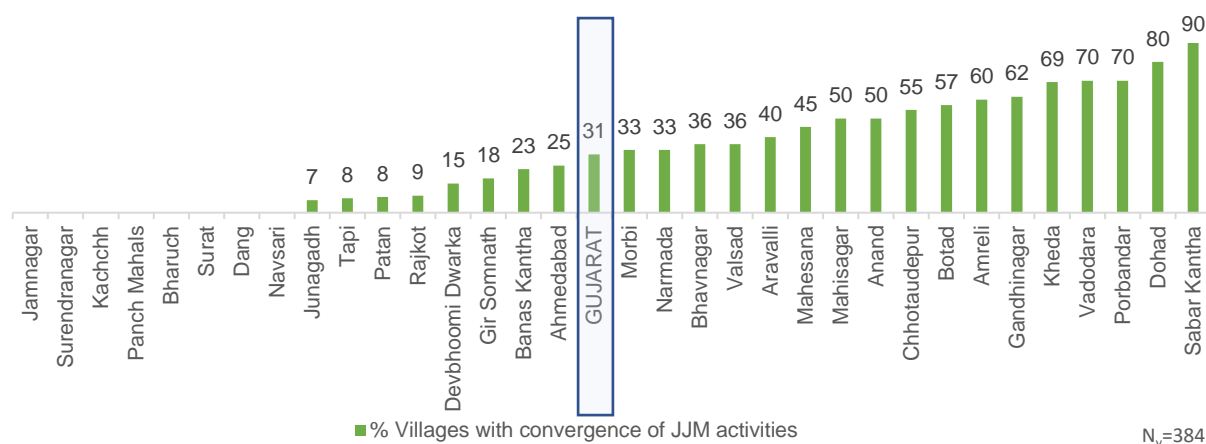
Figure 48: Villages levying water service delivery charges from households



Overall, **87% of villages** in the state levy charge for water service delivery to households whereas **10% HHs** reported paying water service delivery charges at the households.

## C. Convergence of JJM activities with other schemes in villages

Figure 49: Village reported convergence of JJM activities with other schemes in the village

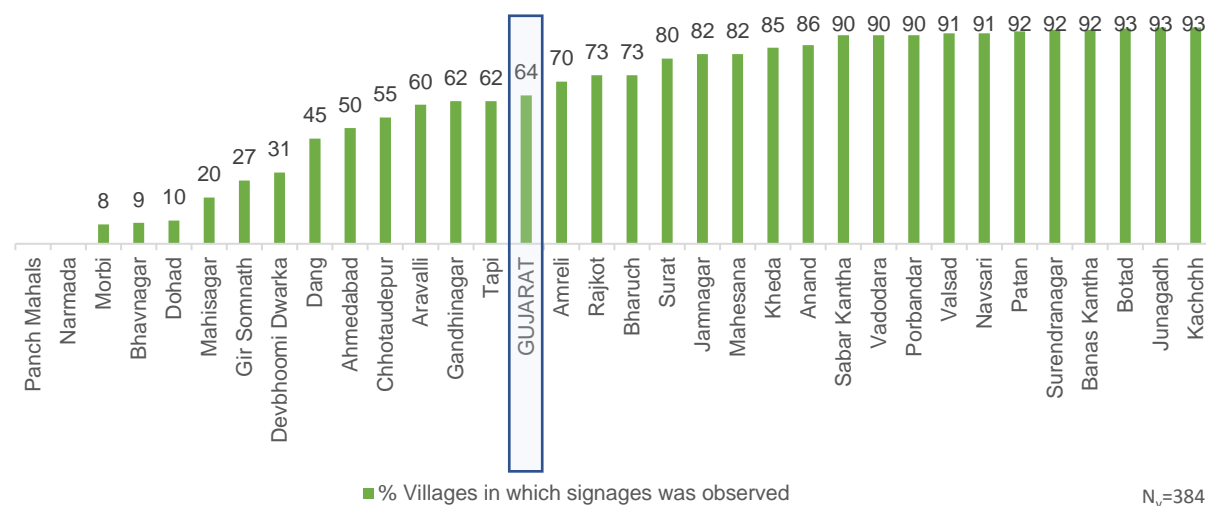


In the state, only **31% villages** in the state reported convergence of activities under JJM with other government programmes/ schemes on skill development, capacity building and training, and awareness generation.

## D. Villages where signages was observed

Signages about JJM were observed in 64% of the sampled villages. Districts of Kachchh, Junagadh, and Botad had the highest proportion of villages where signages were observed (100%).

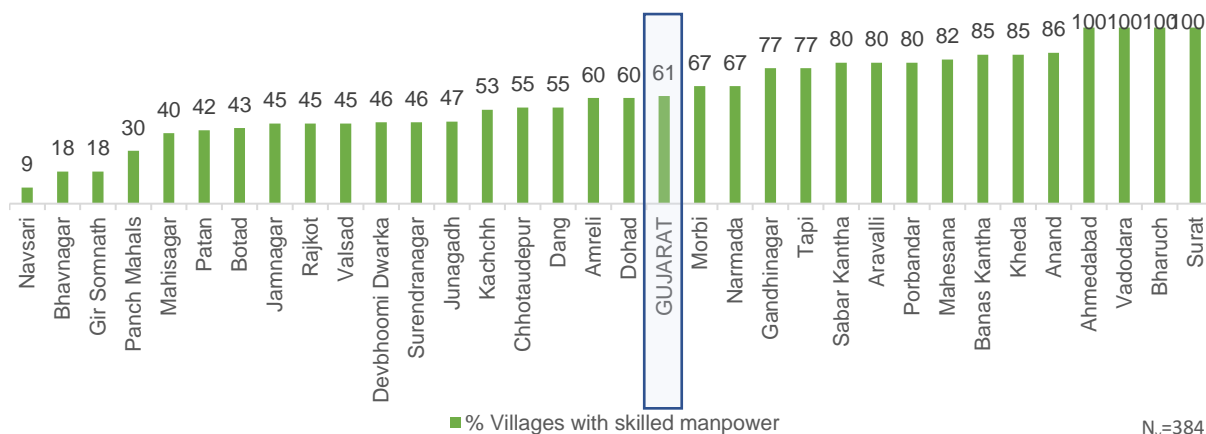
Figure 50: Villages in which signages about JJM was observed



### 3.8. Status of Operation & Maintenance

#### A. Villages with skilled manpower for operation and maintenance (O&M) of PWS schemes

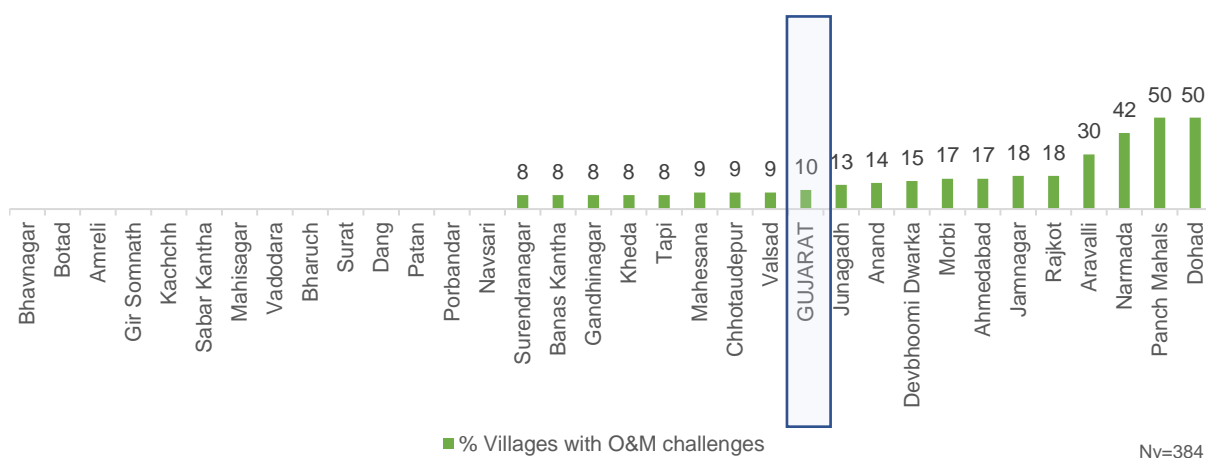
Figure 51: Villages reported having skilled manpower for O&M of PWS schemes



Across the state, **61% villages** in the reported having identified skilled manpower for O&M of PWS schemes, the most reported to be in Surat, Bharuch, Vadodara, and Ahmedabad (100%) and the least in Navsari (9%)

#### B. Villages with O&M challenges

Figure 52: Villages reported having faced O&M challenge

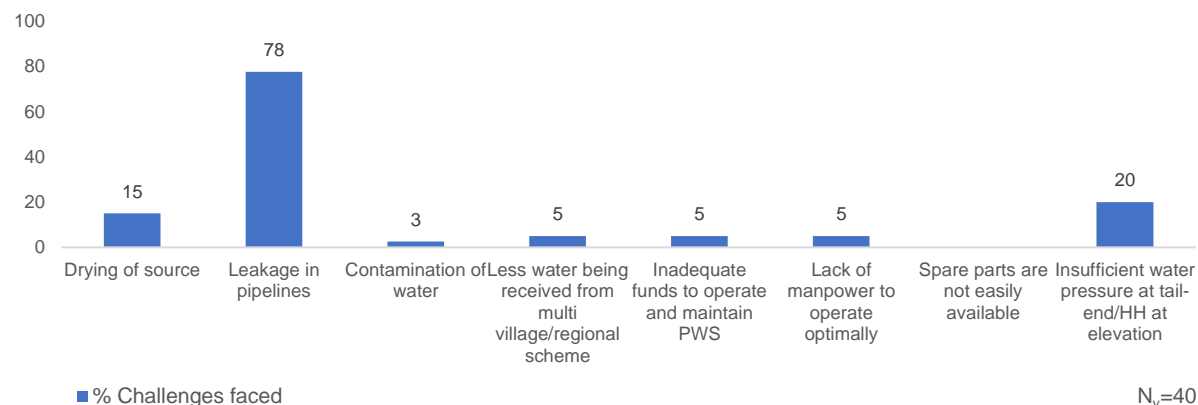


In the state, **10% of villages** in the state reported to have faced challenges with respect to O&M of PWS schemes.

## C. Details of challenges faced

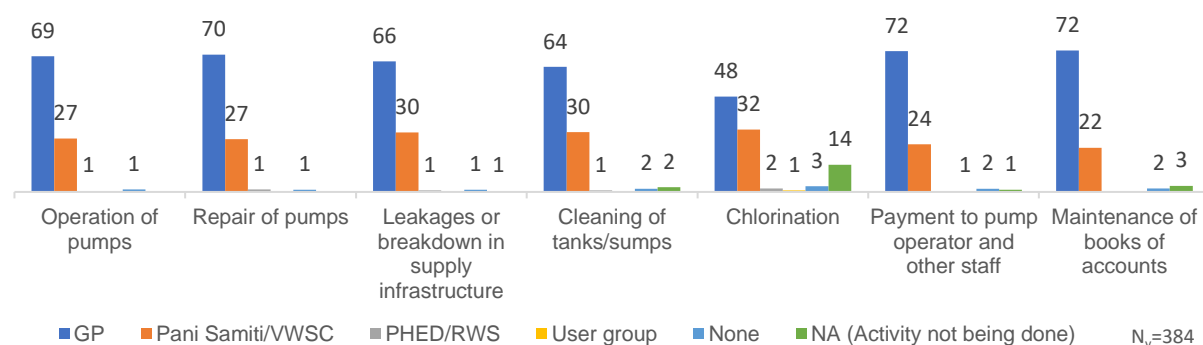
Out of the 23% of villages that had faced challenges with respect to O&M of PWS schemes (40 villages), 'leakage in pipelines' was attributed the most – at 78%.

Figure 53: Details of O&M challenges faced by village



## D. Responsible for O&M

Figure 54: Different bodies responsible for O&M

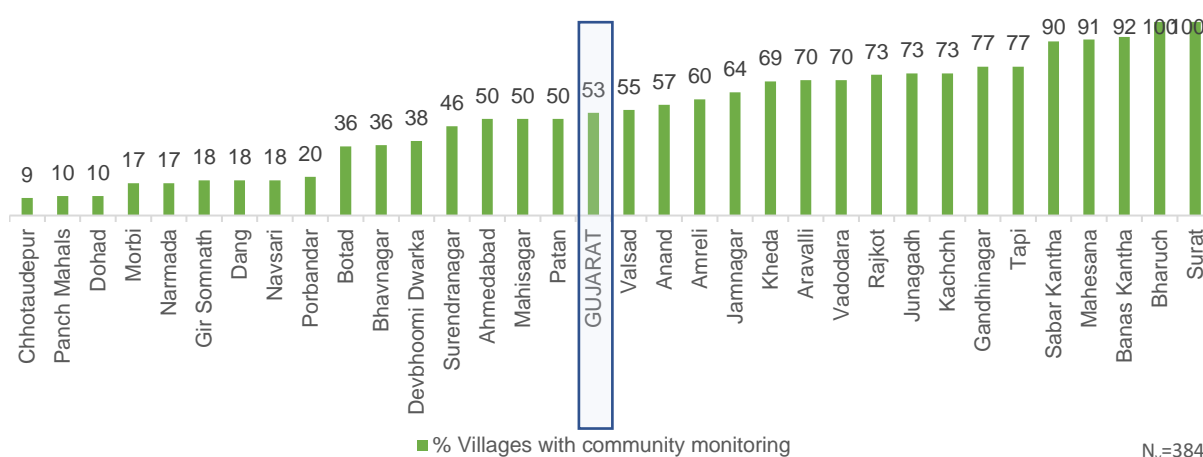


Across the state, villages reported 'GP' the most for being responsible for all essential aspects about operation and maintenance of PWS schemes.

## E. Villages with community level monitoring of water wastage

**53% of villages** in the state reported to have community level monitoring of water wastage.

Figure 55: Villages reported having community level monitoring of water wastage

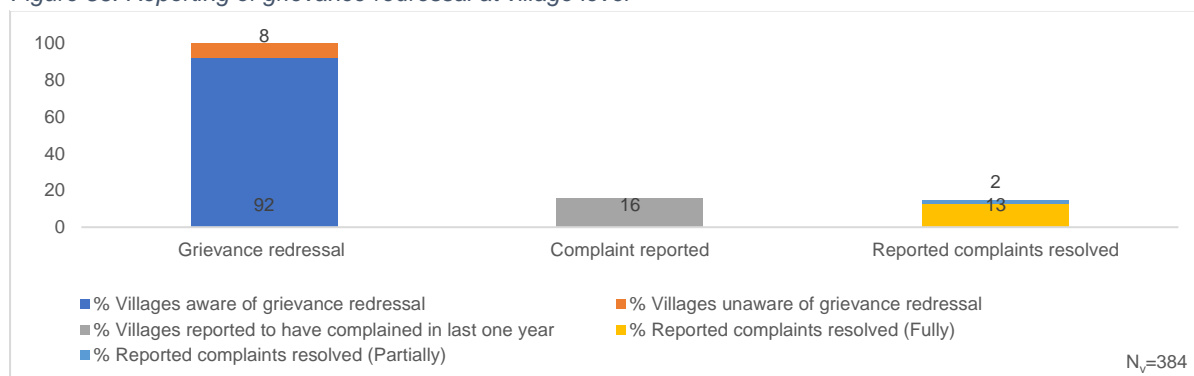


### 3.9. Status of service delivery related grievances and redressal

#### A. Village level

##### Grievance redressal at village

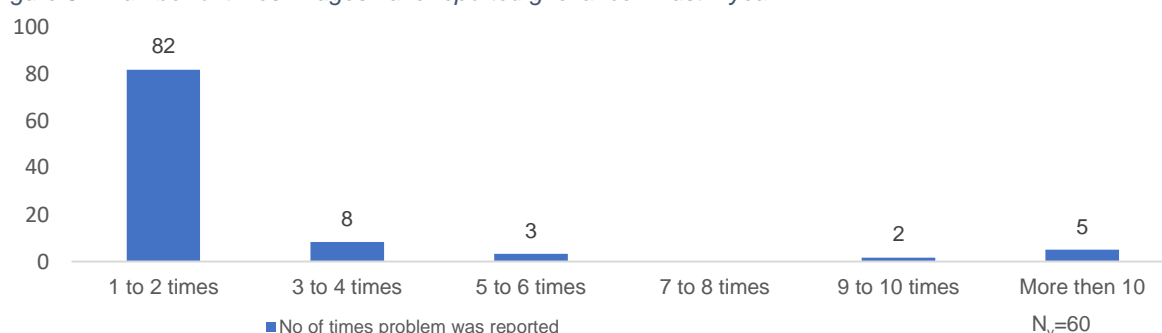
Figure 56: Reporting of grievance redressal at village level



In the state, **92% of villages** reported that they are aware of any grievance redressal mechanism, but only 16% HHs have reported a complaint in the last one year amongst which 13% reported that the complaints are fully resolved while 2% of complaints have been partially resolved.

##### Problem reported in last 1 year

Figure 57: Number of times villages have reported grievance in last 1 year

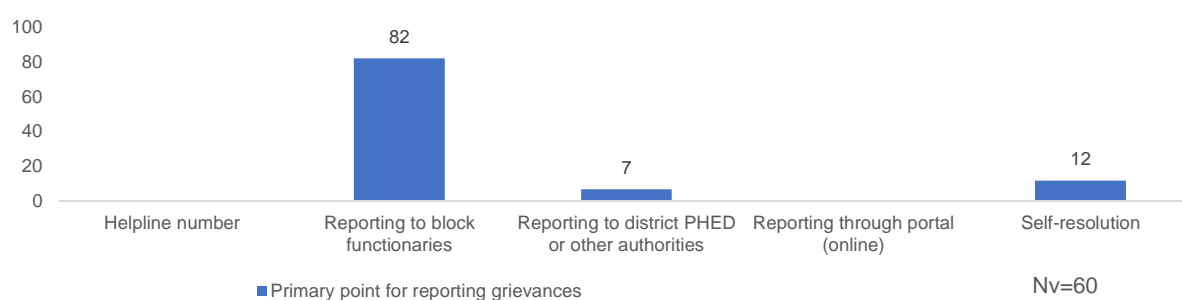


Among the villages who reported a complaint (i.e. 60 villages), 5% villages have reported a complaint more than 10 times in the last one year, while 82% reported a complaint at least once or twice.

##### Primary points for reporting grievances

Among those who reported complaint (i.e., 16% villages, 60 villages), **82% of villages** reported that they report their grievances to **block functionaries** beside other reporting-points

Figure 58: Primary points for reporting grievances by village

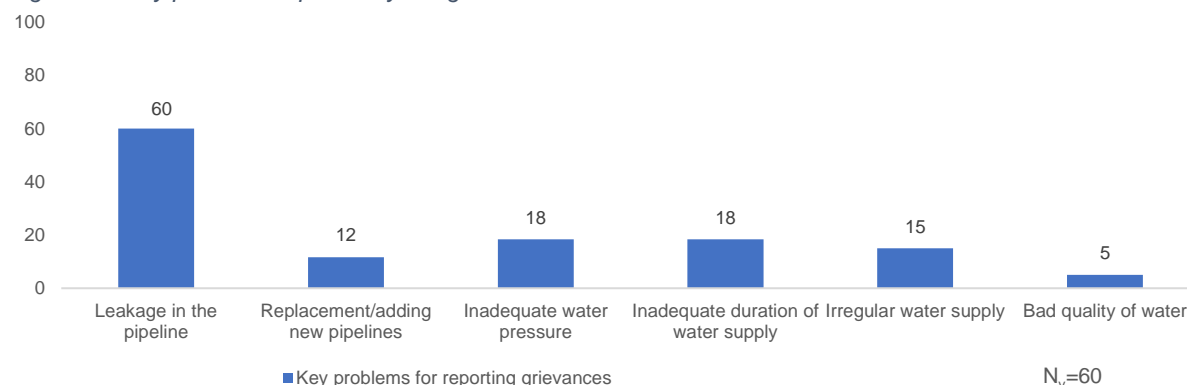




## Key problems for reporting grievances

Overall, among those who reported complaint (i.e., 16% villages, 60 villages) **60% of villages** reported that **leakage in the pipeline** is their most encountered problem for reporting grievances.

Figure 59: Key problems reported by village

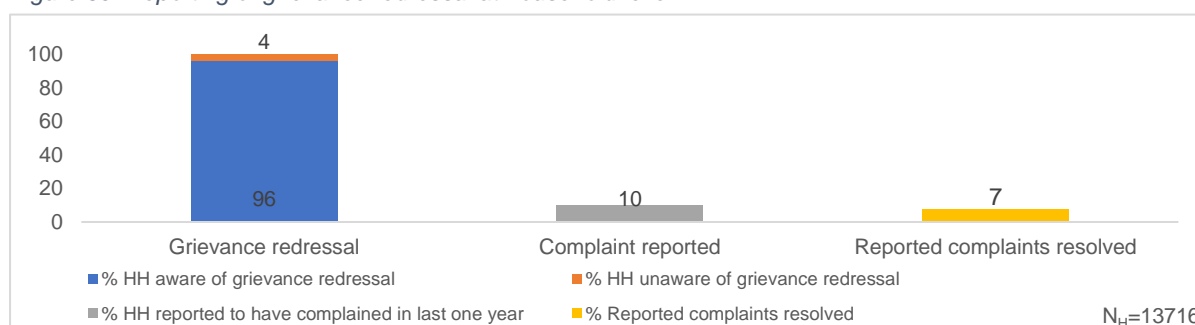


## B. Household level

### Awareness of grievance redressal at household

In the state, **96% of HHs** reported that they are aware of any grievance redressal mechanism w.r.t. HH tap water through PWS, but only 10% HHs have reported a complaint in the last one year and only 7% of complaints have been resolved.

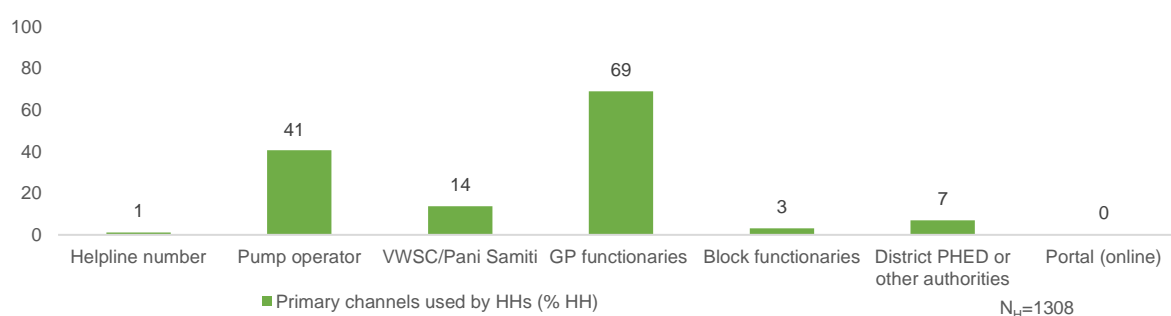
Figure 60: Reporting of grievance redressal at household level



### Primary channels for reporting grievances by households

Among those who reported complaint as shown in the above graph (i.e., 10% HHs, 1308 HHs), **69% of the HHs** reported their complaints to the **GP functionaries** beside other reporting-channels

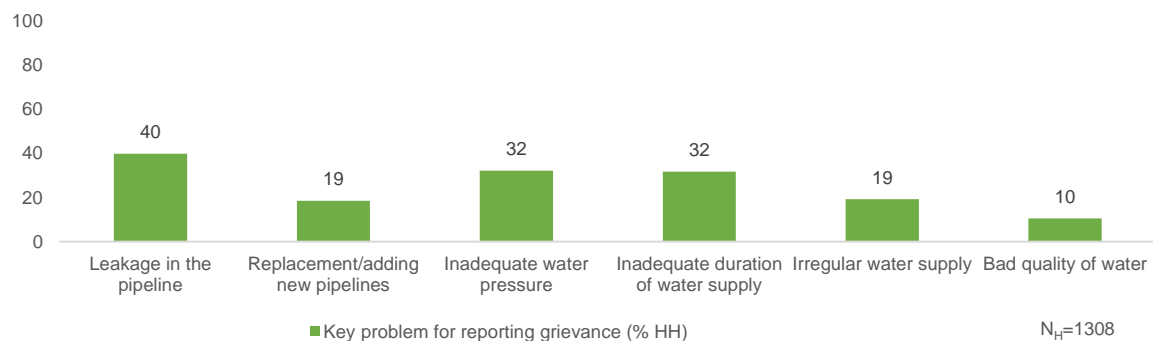
Figure 61: Primary channels for reporting grievances by households



## Key problems for reporting grievances

Overall, among those who reported complaint (i.e., 10% HHs, 1308 HHs) **40%** of the HHs that reported problems was of **leakage in the pipeline** beside other problems

Figure 62: Key problems reported by households

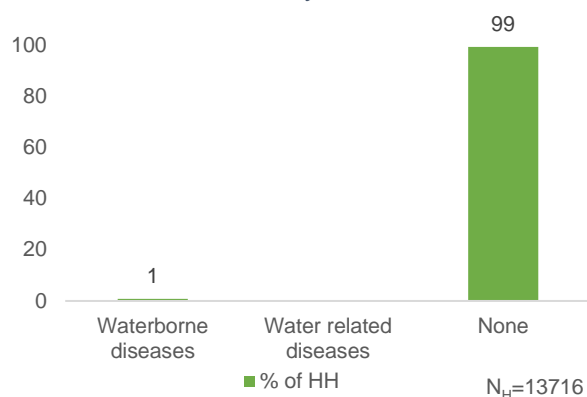


### 3.10. Perception of HHs on Outcome Indicators

#### A. Incidence of water borne diseases at HH level in last one year

Across the state only 1% HHs reported having an incidence(s) of water borne diseases in your household in last one year. The cases recorded were of Dysentery, Diarrhoea, Cholera and Typhoid

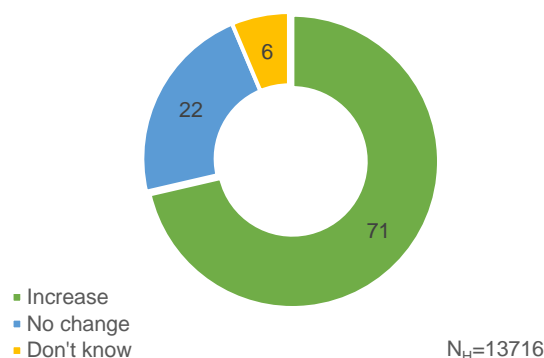
Figure 63: Household reported incidence of water borne diseases in last one year



#### B. Change in employment days since FHTC programmes/schemes

Since having a functional HH tap connection, 71% HHs across the state has reported that there has been a change in the no. of employment days of the adult HH members while 22% HHs reported no change

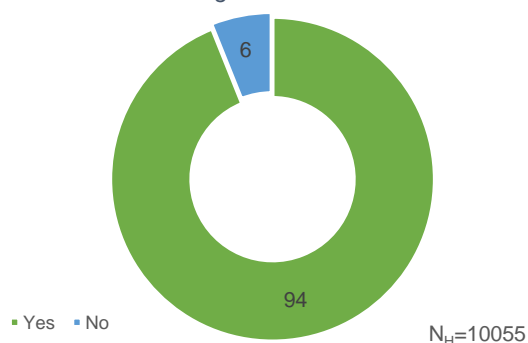
Figure 64: Household reported a change in employment days since FHTC programmes /schemes



#### C. Reduction in time and effort in collecting water

Out of the HHs reported (i.e. 10055) that female members used to fetch water before HH tap connection, 94% reported that post installation of HH tap connection it helped reduction of time and effort in collection of water

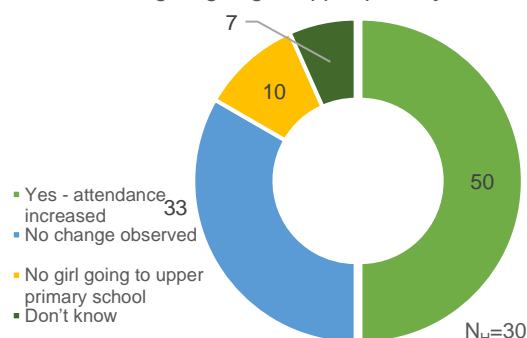
Figure 66: Households reported reduction in time and effort in collecting water



#### D. Impact on attendance of the girls going to upper primary

Across the state, 50% HHs reported that since having a functional HH tap connection the attendance of the girls going to schools increased, while 33% HHs reported no change in attendance which could possibly be an impact of shutting down of schools due to COVID-19 related lockdown during the survey

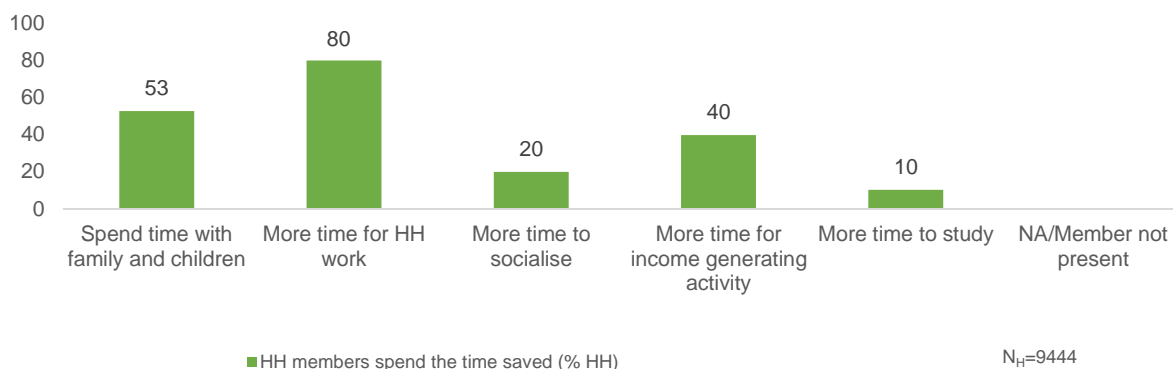
Figure 65: Households reported increase of attendance of girls going to upper primary school



## E. HHs are using time saved due to provision of tap connection

Time saved by female HH members against collecting water, post installation of HH tap connections, was reportedly most utilized for other HH work (80%).

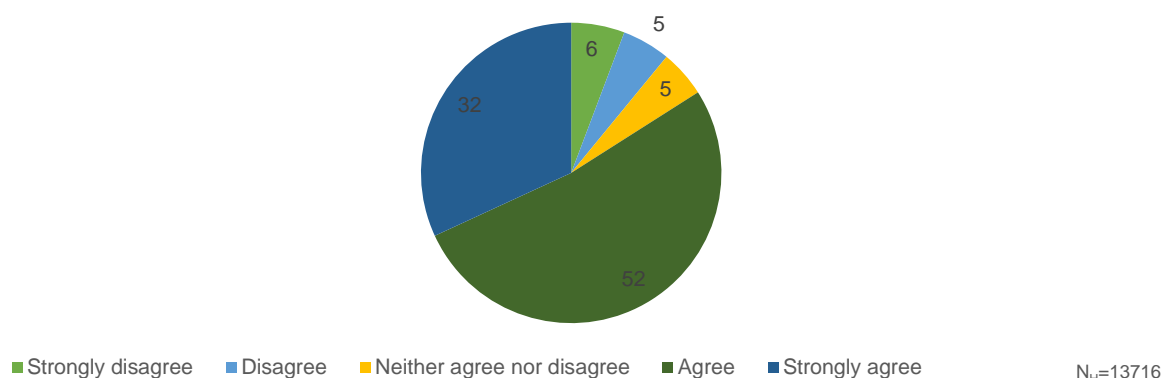
Figure 67: Utilization of time saved by households post installation of HH tap connection



## F. Change in social status

Sense of pride and positive change in social status was reportedly realized by 84% of HHs post the installation of HH tap connections.

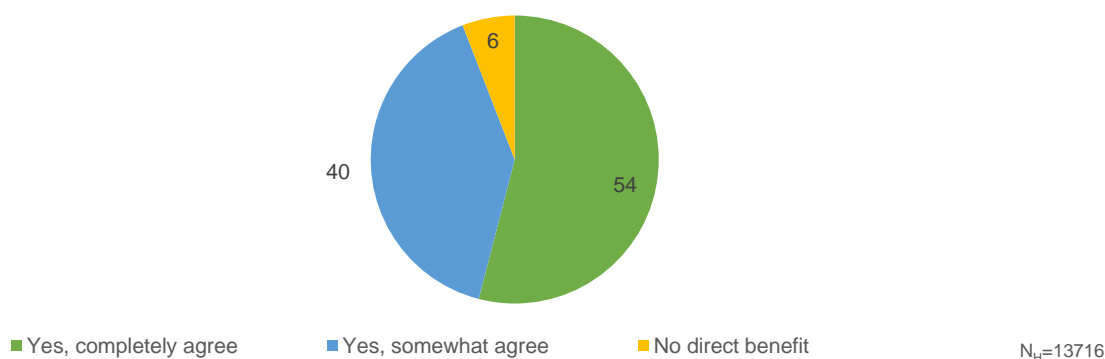
Figure 68: Households reported to have a positive change in social status








## G. Direct benefits in terms of income due to FHTC

Across the state, 54% of sampled HHs reported being in complete agreement that there had been direct benefits on their HH income since the installation of HH tap connection, while 40% HHs reported being in partial agreement against the same.

Figure 69: Households reported to have received direct benefits in terms of income due to FHTC



### 3.11. User satisfaction

Table No. 6: User satisfaction - more than 75% happy with FHTC services			
S. No.	Parameter (N <sub>h</sub> =13716)		In %
1	Regularity		92.7
2	Overall quality		95.0
3	Colour		96.1
4	Taste		95.3
5	Odour		93.8

**Note:**

Base (N<sub>v</sub>)=384 means all villages sampled and covered in Gujarat state

Base (N<sub>H</sub>)=13716 means all households sampled and covered across the 384 villages in Gujarat state

Base (N<sub>H</sub>)=13623 means all households sampled where water sample be collected across the 384 villages in Gujarat state

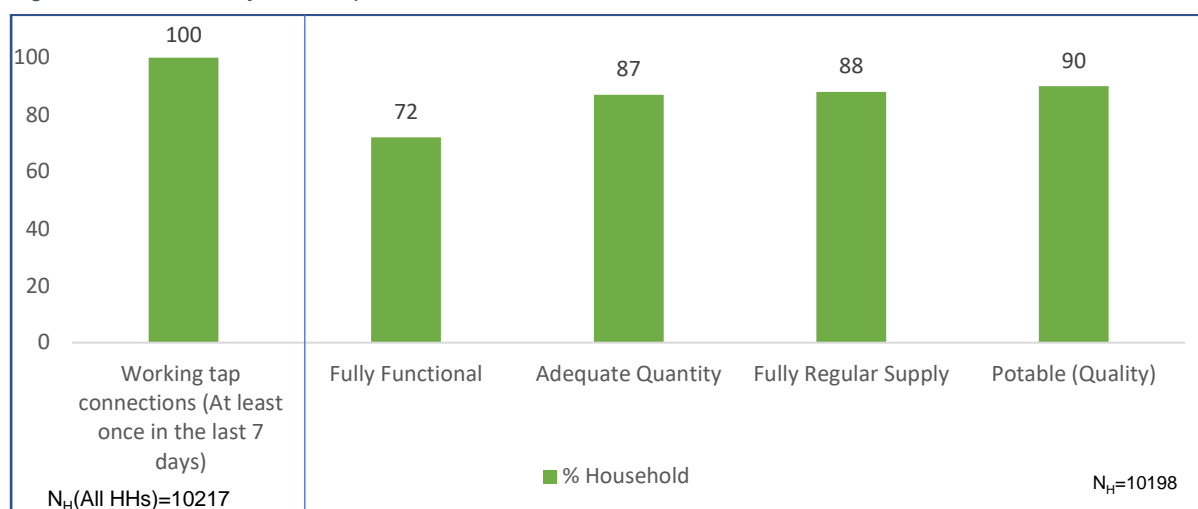
Base (N<sub>H</sub>)=10055 means all households sampled where female members used to fetch water before HH tap connection

Base (N<sub>H</sub>)=30 means all households sampled that had adolescent girls as one of HH members

## 4. Functionality status of FHTC at household level for Har Ghar Jal districts

### 4.1. Overall Functionality (in %)

Figure 70: Functionality of HH tap connection for Har Ghar Jal districts



\* Fully Functional has been computed as = Adequate Quantity  $\cap$  Fully Regular Supply  $\cap$  Potable (Quality)

Please note: For Har Ghar Jal district, N<sub>H</sub>=10198 implies all HHs where water was found on the day of the survey.

It has been found that 100 percent of the sampled HHs (N=10217) had working tap connections. 72 percent HHs in the state were found to have fully functional HH tap water connection. Moreover, more than 4 out of 5 households (87 percent) received adequate quantity ( $\geq 55$  LPCD) of water supply and more than 4 out of 5 received regular supply (88 percent) of water. The on-site testing and lab test results of the water indicates that about 9 out of 10 (90%) sampled households in the state receive potable water.

S. No.	District	Working tap connections (HHs which received water through FHTC at least once in the last 7 days) (% HH)	Fully functional (% HH)	Adequate Quantity (% HH)	Full Regular Supply (% HH)	Potable (Quality) (% HH)
1.	Jamnagar	100	81	91	91	81
2.	Devbhoomi Dwarka	100	25	41	40	25
3.	Rajkot	100	76	91	84	76
4.	Morbi	100	76	86	86	76
5.	Surendranagar	100	85	88	93	85
6.	Bhavnagar	100	50	66	68	50
7.	Botad	100	60	71	83	60
8.	Amreli	100	45	79	92	45
9.	Junagadh	100	84	88	98	84
10.	Gir Somnath	100	53	68	84	53
11.	Kachchh	100	79	81	96	79
12.	Banas Kantha	100	72	96	98	72
13.	Sabar Kantha	100	82	90	92	82
14.	Aravalli	100	98	100	100	98
15.	Mahesana	100	70	99	98	70
16.	Gandhinagar	100	78	91	97	78

<b>Table No. 7: Quantity, Regularity, and Quality of FHTC for Har Ghar Jal districts (%HH)</b>						
<b>S. No.</b>	<b>District</b>	<b>Working tap connections (HHs which received water through FHTC at least once in the last 7 days) (% HH)</b>	<b>Fully functional (% HH)</b>	<b>Adequate Quantity (% HH)</b>	<b>Full Regular Supply (% HH)</b>	<b>Potable (Quality) (% HH)</b>
17.	Ahmedabad	100	91	98	96	91
18.	Kheda	100	94	99	96	94
19.	Mahisagar	100	29	29	55	29
20.	Panch Mahals	0	0	0	0	0
21.	Vadodara	100	94	94	100	94
22.	Chhotaudepur	100	70	98	93	70
23.	Bharuch	100	84	100	85	84
24.	Surat	100	61	100	62	61
25.	Tapi	100	92	93	97	92
26.	Valsad	100	95	96	100	95
27.	Dang	100	95	99	97	95
28.	Patan	100	71	92	87	71
29.	Porbandar	100	81	98	99	81
30.	Anand	100	10	24	18	10
31.	Dohad	100	0	94	90	0
32.	Narmada	100	94	96	100	94
33.	Navsari	100	72	87	88	72
34.	<b>Gujarat</b>	<b>100</b>	<b>81</b>	<b>91</b>	<b>91</b>	<b>81</b>

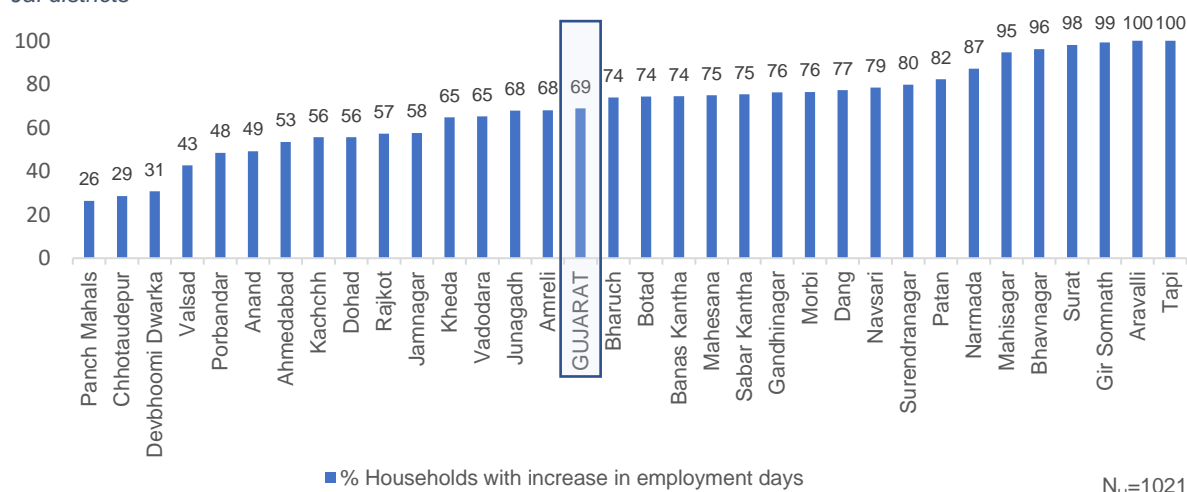
# Potable water has been considered basis testing of water samples through laboratory tests for physical, chemical, and bacteriological as given in Table 5 parameters (within acceptable/ permissible range) and onsite testing of pH. The details of laboratory test are mentioned in the table given above in the glossary.

## 4.2. Perception of HHs from Har-Ghar-Jal villages on Outcome Indicators

### A. Change in employment days since FHTC programmes/ schemes

Across the state, 69 percent of the sampled households reported that employment days increased since the installation of FHTC.

Figure 71: Household reported a change in employment days since FHTC programmes /schemes in Har Ghar Jal districts

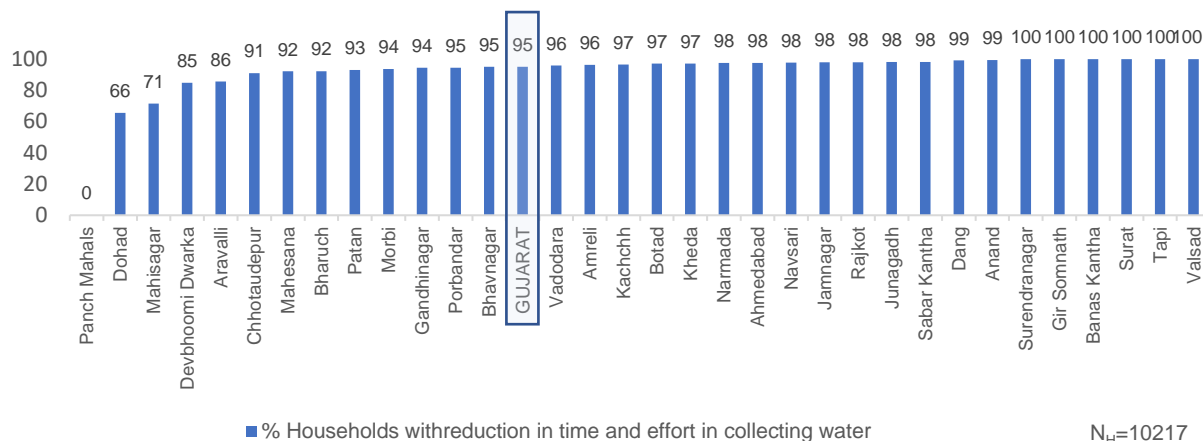




## B. Reduction in time and effort in collecting water

Similarly, about 95% of the sampled households also reported that the effort and time in collecting water reduced after installation of FHTC.

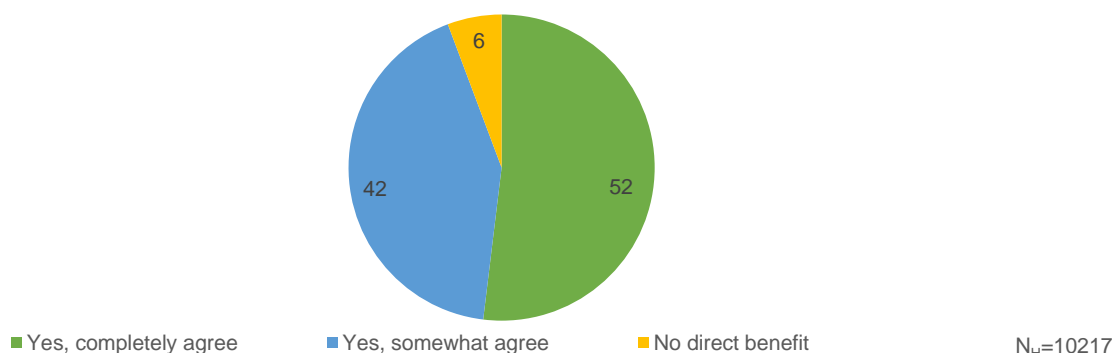
Figure 72: Households reported reduction in time and effort in collecting water in Har Ghar Jal district



### 4.3. Direct benefits in terms of income due to FHTC

Across the nation, 52% of sampled HHs from HGJ villages reported being in complete agreement that there had been direct benefits on their HH income since the installation of HH tap connection, while 39% reported being in partial agreement against the same.

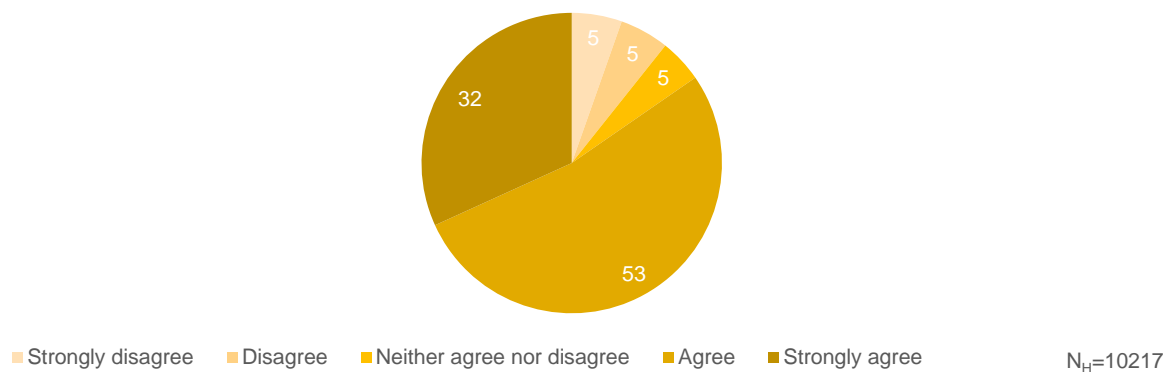
Figure 73: Households reported to have received direct benefits in terms of income due to FHTC in Har Ghar Jal districts



#### 4.4. Change in social status

Almost four-fifth of the households felt HH tap connection earned them more respect, feeling of pride and brought a positive change in their social status.

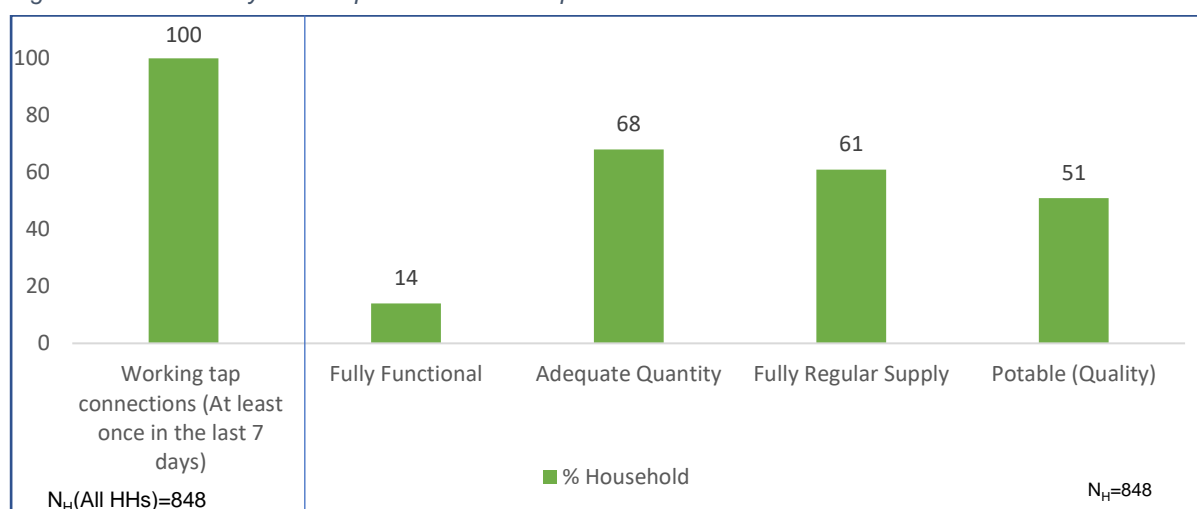
Figure 74: Households reported to have a positive change in social status in Har Ghar Jal district



## 5. Functionality status of FHTC at household level for aspirational districts

### 5.1. Overall Functionality (in %)

Figure 75: Functionality of HH tap connection for Aspirational districts



\* Fully Functional has been computed as = Adequate Quantity  $\cap$  Fully Regular Supply  $\cap$  Potable (Quality)

Please note: For aspirational district, N<sub>H</sub>=848 implies all HHs where water was found on the day of the survey.

It has been found that 100 percent of the sampled HHs (N=848) had working tap connections. 14 percent HHs in the state were found to have fully functional HH tap water connection. Moreover, more than 3 out of 5 households (68 percent) received adequate quantity ( $\geq 55$  LPCD) of water supply and more than 3 out of 5 received regular supply (61 percent) of water. The on-site testing and lab test results of the water indicates that more than half (51%) sampled households in the state receive potable water.

Table No. 8: Quantity, Regularity, and Quality of FHTC for aspirational districts (%HH)						
S. No.	District	Working tap connections (HHs which received water through FHTC at least once in the last 7 days) (% HH)	Fully functional (% HH)	Adequate Quantity (% HH)	Full Regular Supply (% HH)	Potable (Quality) (% HH)
1.	Dohad	100	28	42	33	99
2.	Narmada	100	0	95	90	0
3.	Gujarat	100	14	68	61	51

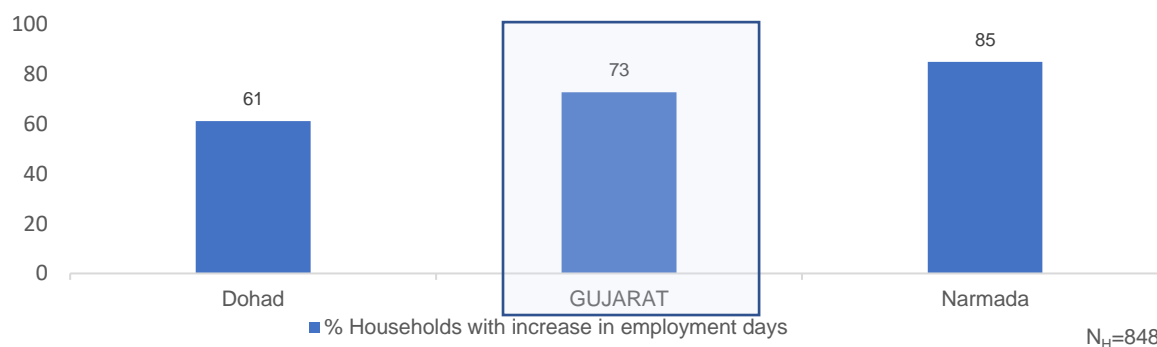
# Potable water has been considered basis testing of water samples through laboratory tests for physical, chemical, and bacteriological as given in Table 5 parameters (within acceptable/ permissible range) and onsite testing of pH. The details of laboratory test are mentioned in the table given above in the glossary.

## 5.2. Perception of HHs from aspirational districts on Outcome Indicators

### A. Change in employment days since FHTC programmes/ schemes

Only around 73 percent of the households in aspirational districts reported increase in employment days since installation of FHTC.

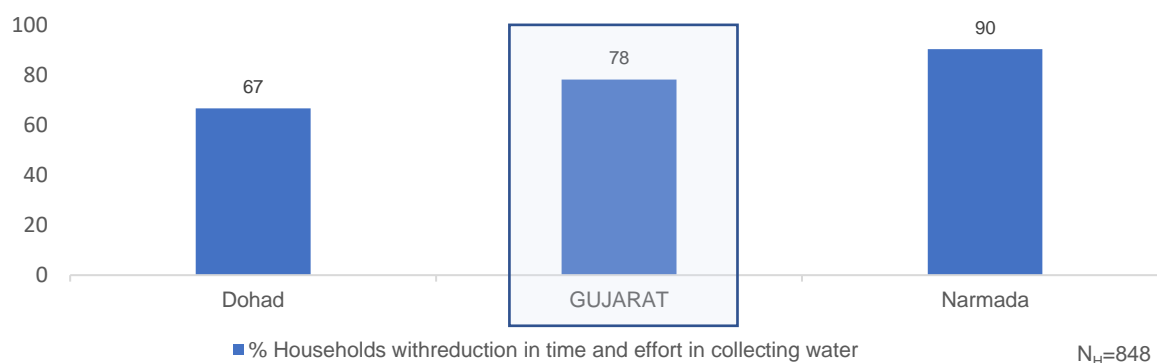
Figure 76: Household reported a change in employment days since FHTC programmes /schemes in Aspirational districts



### B. Reduction in time and effort in collecting water

Only around 78 percent of the households in aspirational districts reported reduction in time and effort in collecting water.

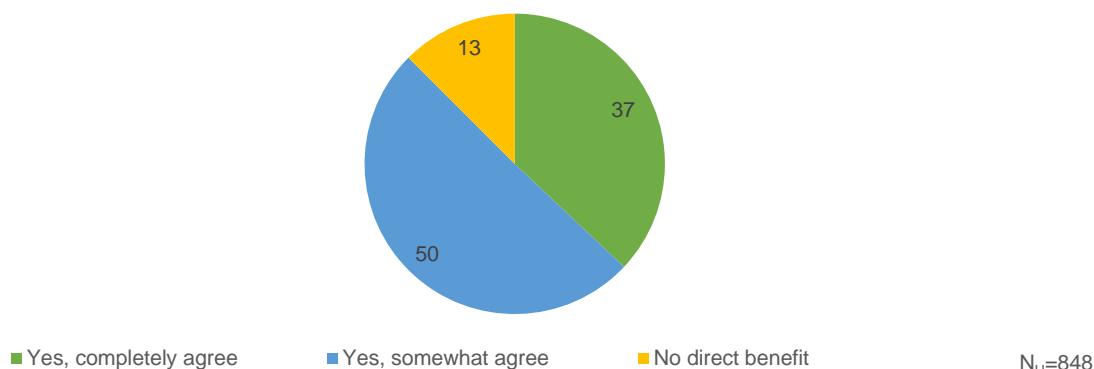
Figure 77: Households reported reduction in time and effort in collecting water in Aspirational district



### 5.3. Direct benefits in terms of income due to FHTC

Across the state, 37% of sampled HHs from aspirational districts reported being in complete agreement that there had been direct benefits on their HH income since the installation of HH tap connection, while 50% reported being in partial agreement against the same.

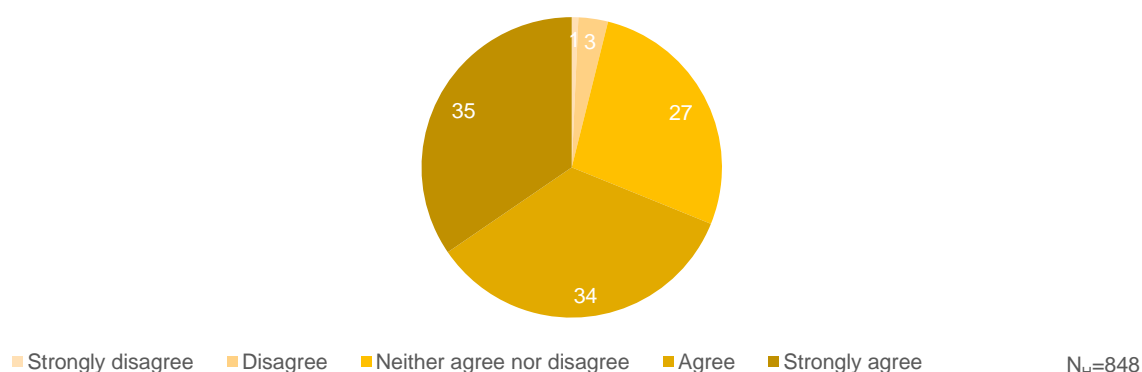
Figure 78: Households reported to have received direct benefits in terms of income due to FHTC in Aspirational districts



### 5.4. Change in social status

More than two-third of the households in aspirational districts felt HH tap connection earned them more respect, feeling of pride and brought a positive change in their social status.

Figure 79: Households reported to have a positive change in social status in Aspirational district



## 6. Annexure

<b>Table No. 9: List of replaced villages</b>				
<b>S. No.</b>	<b>District Name</b>	<b>Village Name</b>	<b>Status of the Scheme (No Scheme/Replaced &amp; Defunct)</b>	<b>Remarks</b>
1	Amreli	Varahsvarup	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Pachapachiya. Scheme found to be functional in replacement village
2	Kachchh	Baroi	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Nana Kapaya. Scheme found to be functional in replacement village
3	Kachchh	Murchbana	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Laxmipar Bhujay. Scheme found to be functional in replacement village
4	Gandhinagar	Randheja	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Jalund. Scheme found to be functional in replacement village
5	Gandhinagar	Pethapur	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Ratanpur. Scheme found to be functional in replacement village
6	Mahisagar	Bar	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Baroda. Scheme found to be functional in replacement village
7	Panch Mahals	Narsana	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Nathujina Muv. Scheme found to be defunct in replacement village
8	Mahisagar	Malanpur	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Manchod. Scheme found to be functional in replacement village
9	Mahisagar	Babrol	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Barela. Scheme found to be functional in replacement village
10	Mahisagar	Ditvas	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Bhanpur (Khan. Scheme found to be functional in replacement village
11	Bharuch	Dadheda	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Choramla. Scheme found to be functional in replacement village
12	Tapi	Tichakpura	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Champavadi. Scheme found to be functional in replacement village
13	Porbandar	Dharampur	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Mahira. Scheme found to be functional in replacement village
14	Dohad	Bandibar	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Bavka. Scheme found to be functional in replacement village
15	Dohad	Dhodiya	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Golana. Scheme found to be functional in replacement village
16	Narmada	Survani	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Taropa. Scheme found to be functional in replacement village