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

Har Ghar Jal
Jal Jeevan Mission

STATE REPORT: LADAKH

SURVEY DURATION: APRIL 2022

Contents

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	>= 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 UT of Ladakh lies in the northern part of India and has a population of 2,74,289 (Census 2011). It has 2 districts and 250 villages, and 195 villages have PWS schemes. The UT is yet to achieve the Har Ghar Jal status. A total of 102 villages, across all districts, and 1708 households were randomly sampled for the survey, and additionally, water samples from 62 public institutions were tested.

In the assessment among sampled villages, 89% of villages have only one scheme, 11% of villages have 2-3 schemes, and no villages have 4 and more schemes. Mostly all schemes across the UT were found functional.

At the UT level, 65% of the HHs were satisfied with the regularity of the supply, 75% with the quality of the water supplied, 74% with the colour of the water supplied, and 76% with the taste of the supplied tap water.

Overall functionality status of Ladakh

At the UT level, 64% of HHs received water on the day of the survey. While 59% of the HHs were found to have fully functional tap water connections within the premises. Out of which 78% received an adequate quantity of water, 80% reported receiving a fully regular supply of water, and 97% HHs received potable water.

It was found that more than 90% of households received water all 7 days a week and 9% received at least 3 to 4 days, while 1% of the HHs received water once a week. The average duration of water supply across the UT was reported to be 2 hours per day.

In Ladakh, 69% of the villages have reported that water is directly supplied to the households and the remaining 31% reported that water was supplied via an overhead tank, sump, or both.

During the roll-out of the data collection in the UT, 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 Ladakh, 1164 samples of water were submitted, and 1017 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 in none of the HHs. The percentage was relatively higher in AWC, and Schools (100%), wherein there is a possibility of additional chlorine being added locally for the purification of water. All of the samples passed in bacteriological parameter and hence, RC was found only in none. Although there was no RC found, 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 1171 HHs sampled for the FHTC assessment, a water quality test was carried out in 1102 due to the non-availability of water in 36% 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 100% in AWC, HF, and schools.

1% of villages in the UT reported having available field test kits. And 1% 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 2% of villages in the UT reported having a VWSC or a Pani Samiti out of which all of the VWSC/Pani Samitis reported to have more than 50% female members. In the UT, 2% of villages reported that VWSC/ Pani Samiti is responsible for the operation and maintenance of pipe water supply.

3% of villages reported having identified skilled manpower for O&M of PWS schemes. None of villages in the UT reported having faced challenges with respect to O&M of PWS schemes.

64% of HHs reported that they are aware of any grievance redressal mechanism w.r.t. HH tap water through PWS, but only 4% HHs have reported a complaint in the last year and only 3% of complaints have been resolved. Among those who reported complaints (i.e., 4% HHs, 65 HHs), 52% of the HHs reported their complaints to the pump operators besides other reporting channels.

Overall, 5% of villages in the UT levy charge for water service delivery to households whereas 5% HHs reported paying water service delivery charges at the households.

85% 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 UT also needs to further strengthen communication for the quality of water supplied so that every household can use the same for drinking purposes.

Overall, 13% HHs reported using booster pumps to maximize the water flow through their piped water connections.

It was found that 11% of the villages have schemes that are based on groundwater sources, while 25% 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 UT since 2012. 16-% point improvement

in a fully functional scheme was recorded from 2012 to 2013-18. In 2019 and later the same trend has maintained, however, 77% of schemes have been reported to be always functional and 8% as partially functional (i.e., a total of 85% of schemes).

Impact of JJM

Across the UT, no HHs reported having an incidence(s) of water-borne diseases in the last year.

Since having a functional HH tap connection, 40% HHs across the UT have reported that there has been a change in the no. of employment days of the adult HH members while 43% HHs reported no change.

Out of the HHs reported (i.e., 1136) that female members used to fetch water before HH tap connection, 61% reported that post-installation of HH tap connection helped reduction of time and effort in collection of water.
Across the UT, none of the HHs reported that since having a functional HH tap connection the attendance of the girls going to schools has increased, while 8% 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 UT level for Har Ghar Jal villagrs, 88% of households received water on the day of the survey. While 73% of the households were found to have fully functional tap connections. Out of which 86% received an adequate quantity of water, more than four-fifths reported receiving a fully regular supply of water and 97% received potable water.

Since having a functional HH tap connection,41% 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, 68% reported that post-installation of HH tap connection helped reduce time and effort in collecting water. Across the HGJ district, 39% 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	Ladakh
Working tap connections- HHs which received water through tap connection at least once in last 7 days (%)	86	64
Quantity[1] of water received by households		
Adequate quantity (>55 LPCD) (%)	85	78
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	5	9
Inadequate quantity (<40 LPCD) (%)	10	13
Regularity[2] of water received by households		
Fully Regular Supply (as per schedule) (%)	80	80
Partially Regular Supply (not as per schedule) (%)	14	10
Irregular Supply (less than 9 months' supply) (%)	6	10
Potable[3] (Quality) water received by households (%)	87	97
Overall functionality[4] (%)	62	59

Service delivery parameters	India	**Ladakh**
Overall user satisfaction on regularity at the household level (%)	83	65
Overall user satisfaction on quality at the household level (%)	82	75
Households receiving water supply daily-7 days a week (%)	74	90
Daily HH requirement of water being met by FHTC (%)	80	85
Households paying water service delivery charges (%)	35	5
Households aware of grievance redressal mechanism (%)	71	64
Households reported a reduction in time and effort in collecting water (%)	79	61
Average no. of times water is supplied in a day	1	1
Households reported incidence of water-borne diseases in the last year (%)	2	0
Households purifying water before drinking (%)	57	69
Residual Chlorine (RCL) detected with in permissible limits (%)	24	0
Villages with Field Test Kits (%)	30	1
Villages in which bacteriological test was done in last 1 year by VWSC/ Pani Samiti (%)	29	7
Villages reported to have a mechanism for chlorination (%)	21	4

Institutional arrangement	India	Ladakh
Village reported having presence of VWSC/ Pani Samiti (%)	38	2
Villages in which VWSC/ Pani Samiti is responsible for Operation & Maintenance of PWS schemes (%)	14	2
Villages in which persons are trained to use Field Test Kits (%)	31	1
Villages levying water service delivery to households (%)	34	5
Villages having skilled manpower for Operation & Maintenance of PWS schemes (%)	31	3
Community monitoring of water wastage in villages (%)	19	0
Villages in which signages about JJM were observed (%)	15	0

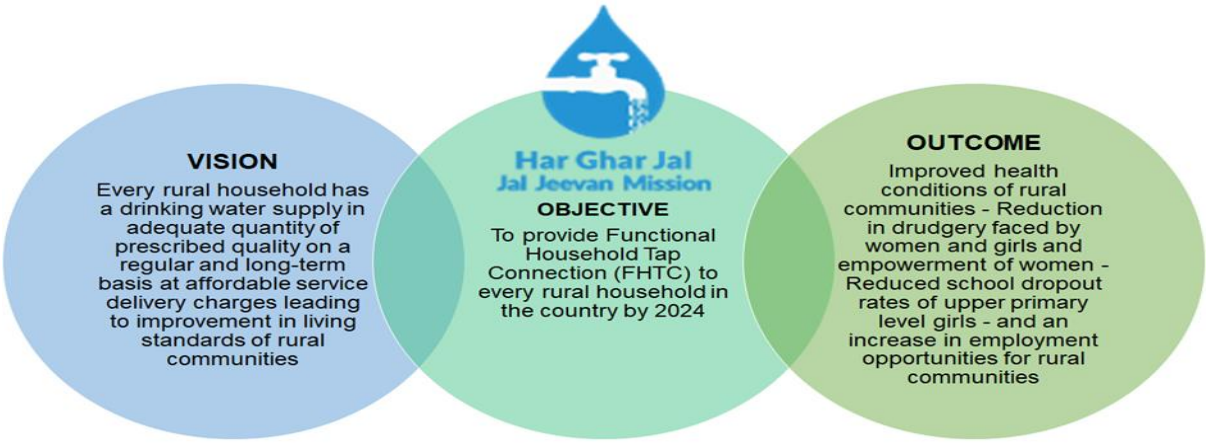
[1] Quantity (in litres) of water received by households per person per day should meet the service level of 55 lpcd
[2] Regularity is receiving water for 12 months or daily basis as per schedule
[3] Potable water has been considered basis testing of water samples through laboratory tests for physical, chemical, and bacteriological parameters (within acceptable/ permissible range) and onsite testing of pH.
[4] 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	Ladakh
Working tap connections- HHs which received water through tap connection at least once in last 7 days (%)	91	72
Quantity of water received by households		
Adequate quantity (>55 LPCD) (%)	88	86
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	4	8
Inadequate quantity (<40 LPCD) (%)	8	6
Regularity of water received by households		
Fully Regular Supply (as per schedule) (%)	84	86
Partially Regular Supply (not as per schedule) (%)	11	4
Irregular Supply (less than 9 months' supply) (%)	5	10
Potable (Quality) water received by households	90	97
Overall functionality (%)	69	73

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: Ladakh

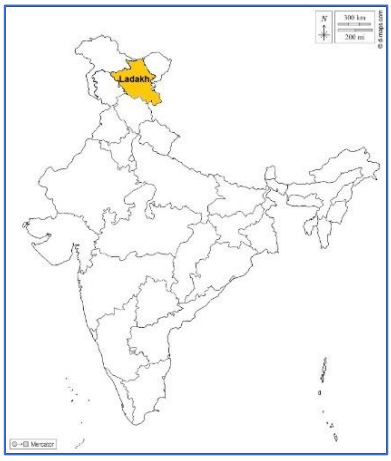
The UT of Ladakh lies on the northern part of India and has a population of 2,74,289 people. It has 2 districts and 250 villages where 195 villages have PWS schemes. The UT lies on the Western Himalayan region and receives an average annual rainfall of about 474mm. Among the villages with PWS schemes, 133 villages (53.20%) have more than 20 households with functional tap connections. The UT is yet to achieve the Har Ghar Jal status.

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

Figure 2: State IMIS Status & Map

IMIS status:

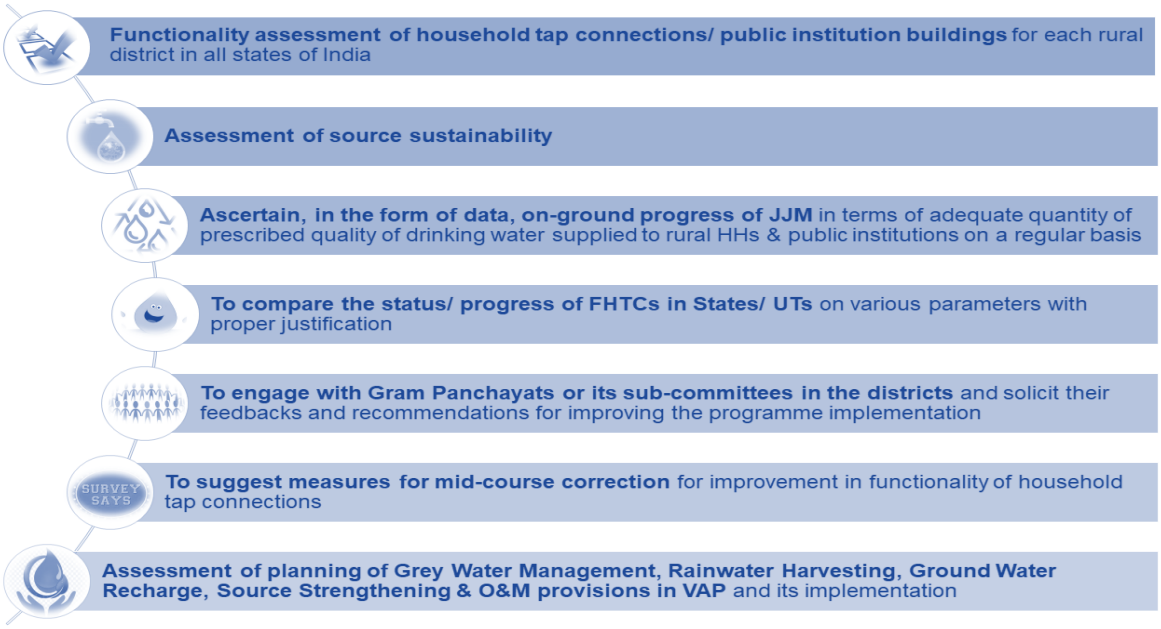
- Not a Har Ghar Jal state.
- No districts are Iron or Fluoride affected
- 133 (53.20% of all) villages with PWS more than 20 FHTC
- 7.20% villages covered under HH tap connections under HGJ



2.2. FHTC Assessment Objectives

The overall objectives of the FHTC assessment are as presented:

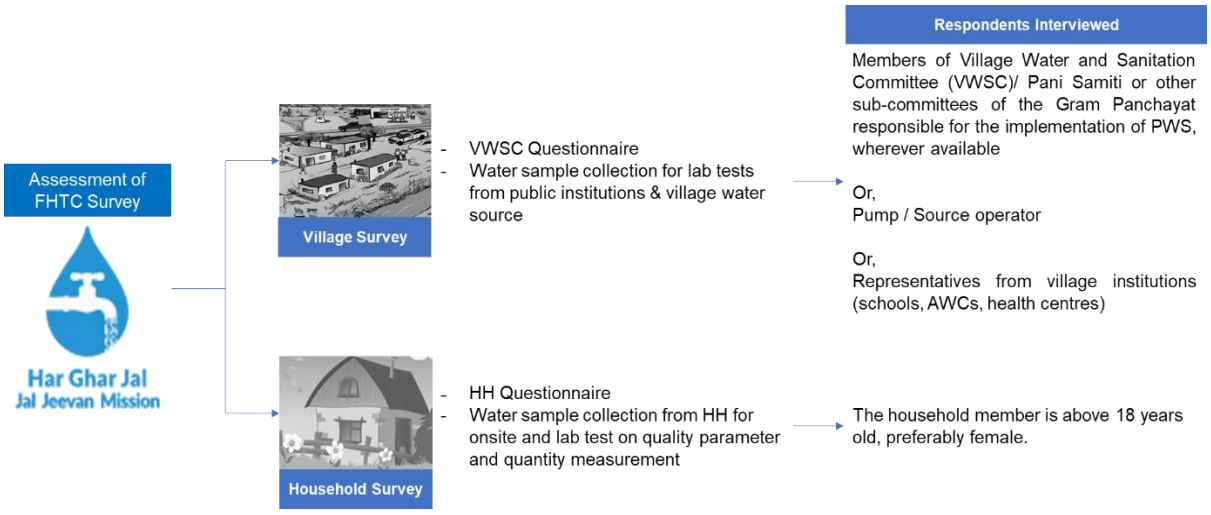
Figure 3: FHTC Assessment Objectives



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 4: 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.

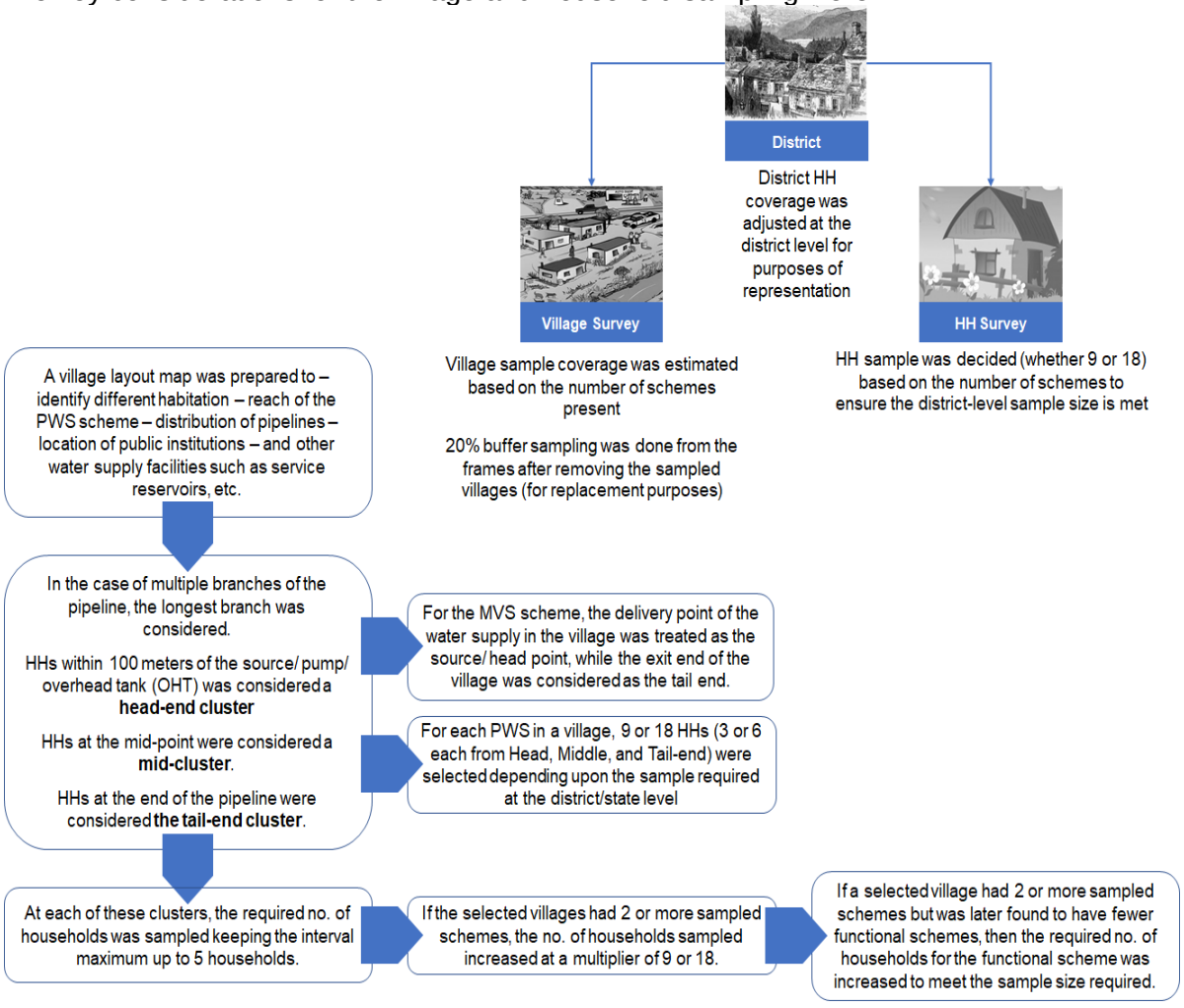
2.5. Sampling Methodology

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 5: Steps for Random Sampling of Villages

Figure 6: Household Selection

The key considerations for the village and household sampling were:

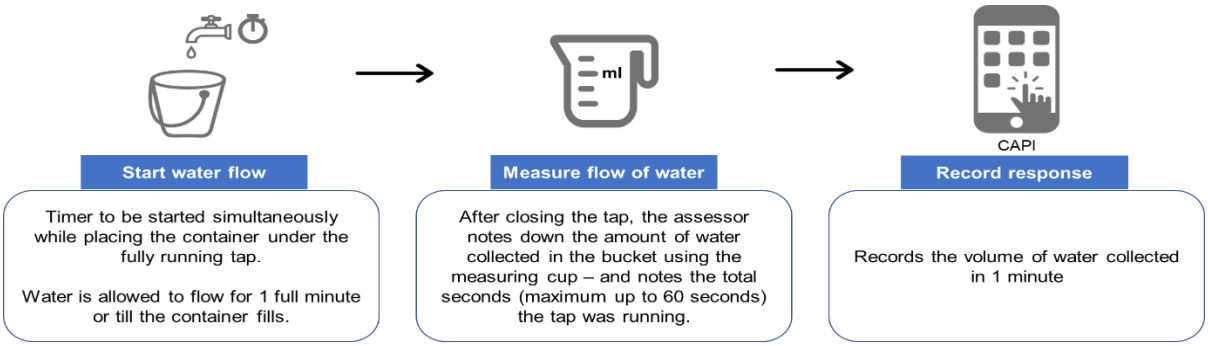


The record of all district-wise village replacements is maintained and reported as part of the annexure.

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 7: 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:

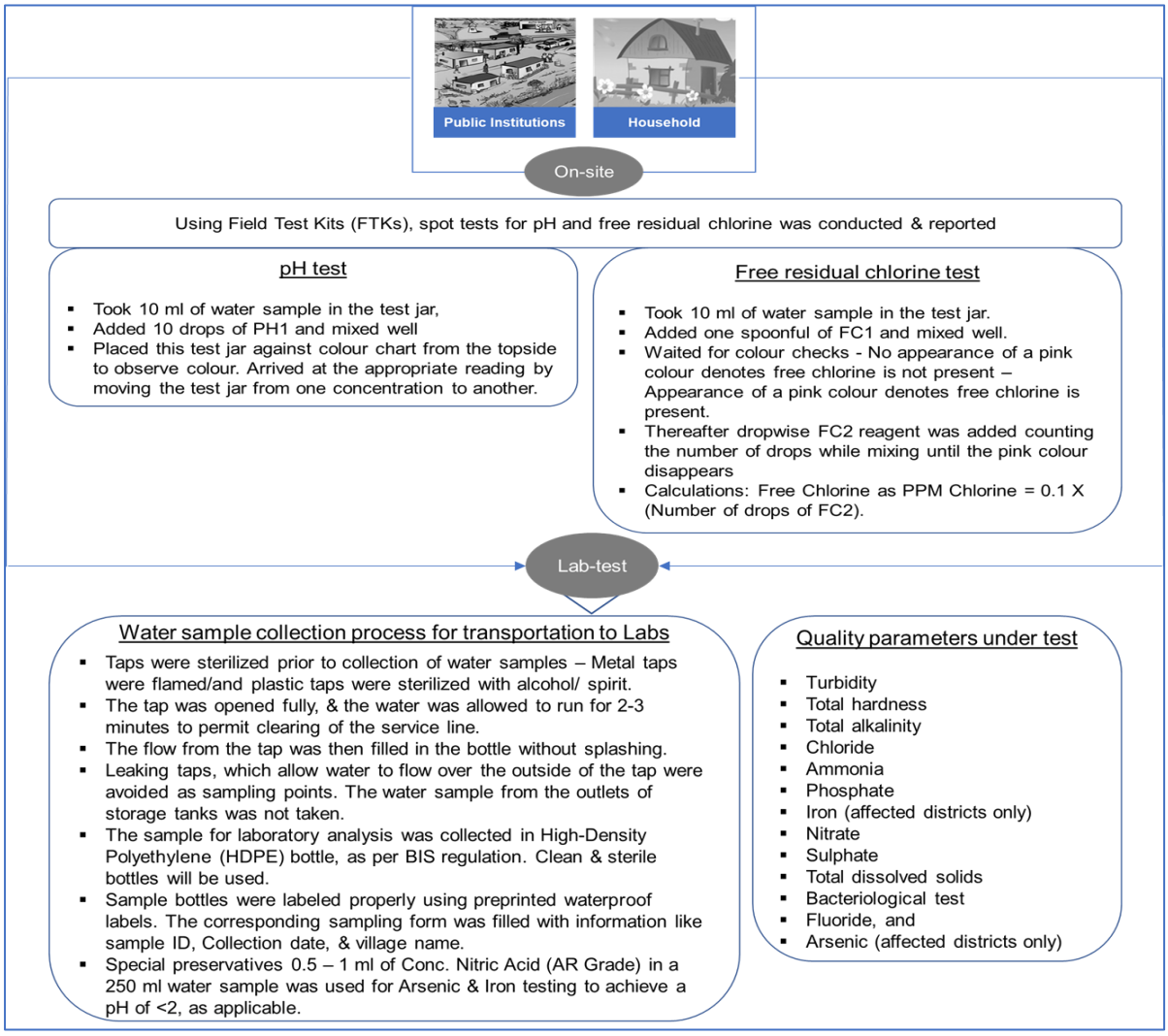
- Assessor first asked and recorded length, breadth, and height.
- Assessor dipped a 5 feet long rod, marked the level of the water table, and calculated the volume – length x breadth x-height of water.
- Next the assessor opened the valve of the connection and allowed the water to flow inside the storage 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 8: On-site & Laboratory-Based Quality Test

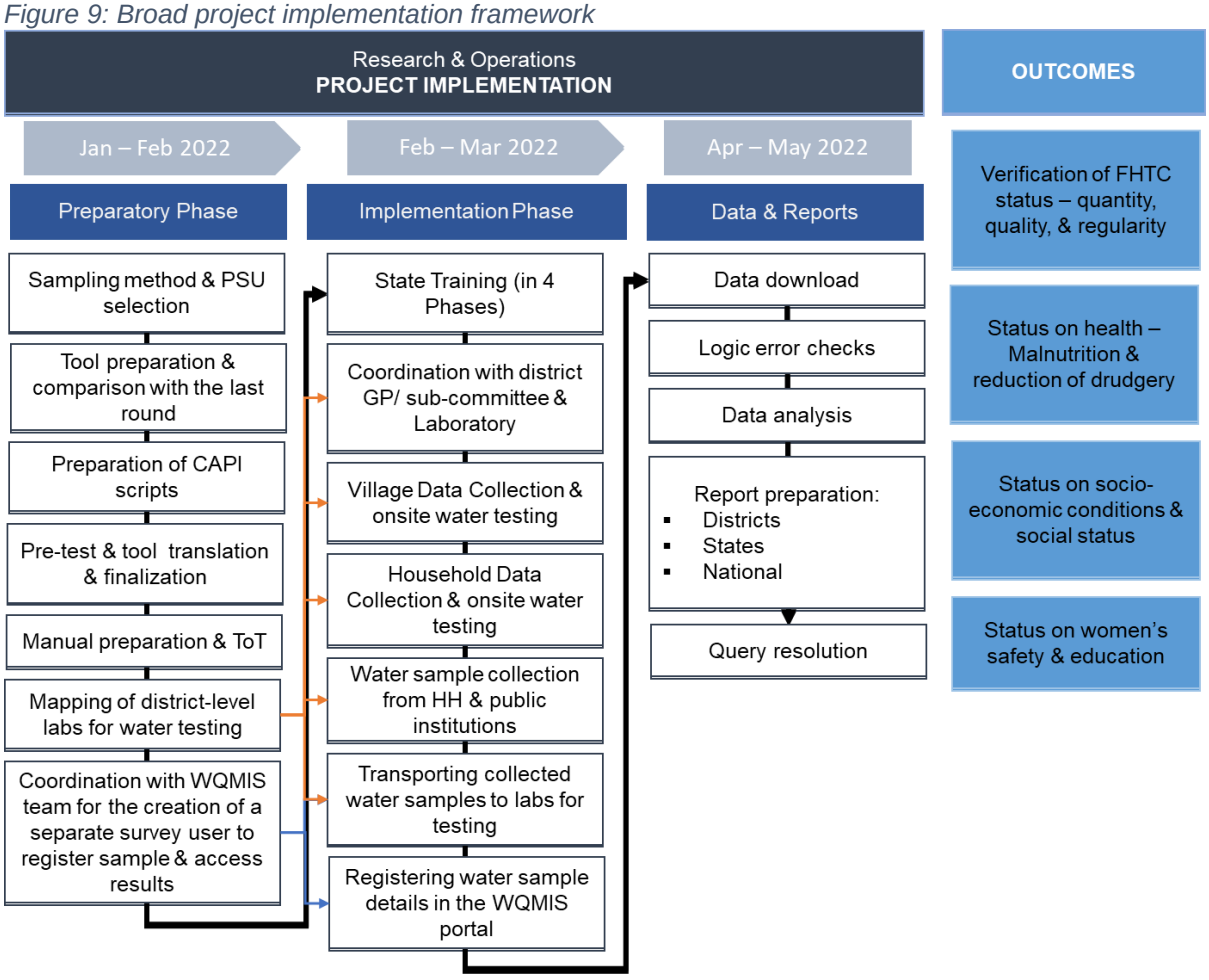


JJM, with the support of the BMI Division of ICMR, enabled a new interface on the WQMIS portal for “Functionality Assessment (FA) User” to enable seamless harmonization of water sample registration, and sample submission for testing, and sharing of results as per the applicable quality parameters.

2.8. Project Implementation

An overview of the project implementation is as presented:

Figure 9: Broad project implementation framework



A total of 2 teams (comprising 2 supervisors, 14 assessors, and 2 water collection assistants) were recruited, trained, and deployed to complete the survey across the states of Ladakh. 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
Ladakh	2 Teams	2nd April	22nd April	23 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

Table No. 2: Sample covered							
	Targeted sample			Achieved sample			
State	District	Village	HH	District	Village	HHs	PIs
India	**712**	**13,300**	**3,00,000**	**712**	**13,299**	**3,01,389**	**16,148**
Ladakh	**2**	**99**	**1,692**	**2**	**99**	**1,711**	**62**

2.10. Sampled village and household profile

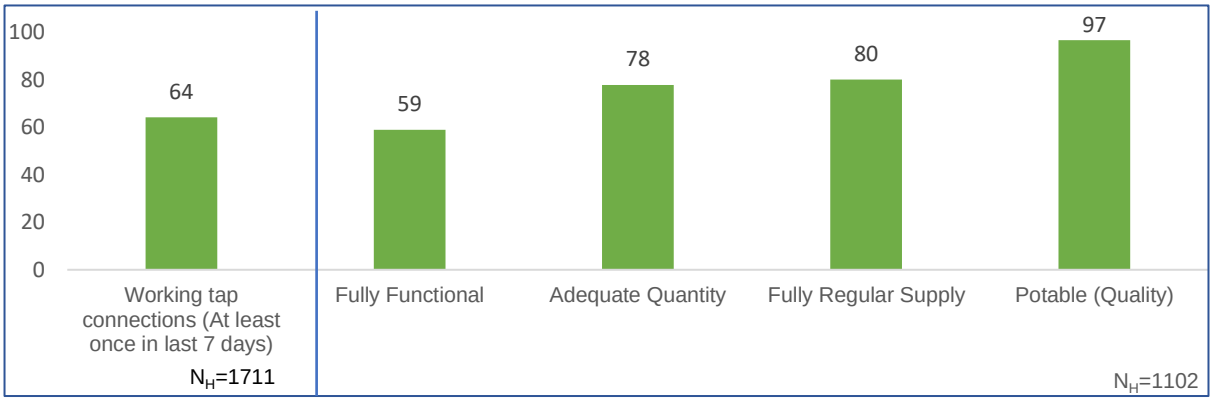
SAMPLED VILLAGES	SAMPLED HOUSEHOLDS
• Total no. of villages covered in the state – **99** • Percentage of SC dominated villages covered in the state is **0%** (while at national level the average is 12.6%) • Percentage of ST dominated villages covered in the state is **100%** (while at national level the average is 20.2%) • **None** of the villages reported to have any historical incidence of water contamination	• Total no. of households covered in the state **– 1711 (Respondents: Male 1421 & Female 287)** • Proportion of General – **2.8%**, SC **8.9%**, ST **88.2%**, OBC **0.1%** households • **16.8%** of the FHTC connections are under the name of a female member • Average household size **– 6.9** • **100%** positive user experience in 3/5 measures

3. Findings

3.1. Functionality status of FHTC at household level

A. Overall Functionality* (in %)

Figure 10: Functionality of HH tap connection



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

Please note: Henceforth, N_H=1102 implies all HHs where water was found on the day of the survey.

It has been found that 64% of the sampled HHs (N=1711) had working tap connections. Moreover, more than three-fourth of the households (78%) received adequate (>=55 LPCD) water supply and 4 out of 5 received regular supply (80%) of water. The on-site testing and lab test results of the water indicates that almost all (97%) of the sampled households in the UT receive potable water.

Out of the 1711 HHs sampled for the FHTC assessment, water quantity and quality test was carried out in 1102 due to non-availability of water in 36% HHs on the day of survey.

Quantity, Regularity, and Quality of water of HH tap connection at the district level:

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)
1.	Leh (Ladakh)	65	92	85	95
2.	Kargil	64	64	75	99
3.	**LADAKH**	**64**	**78**	**80**	**97**

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

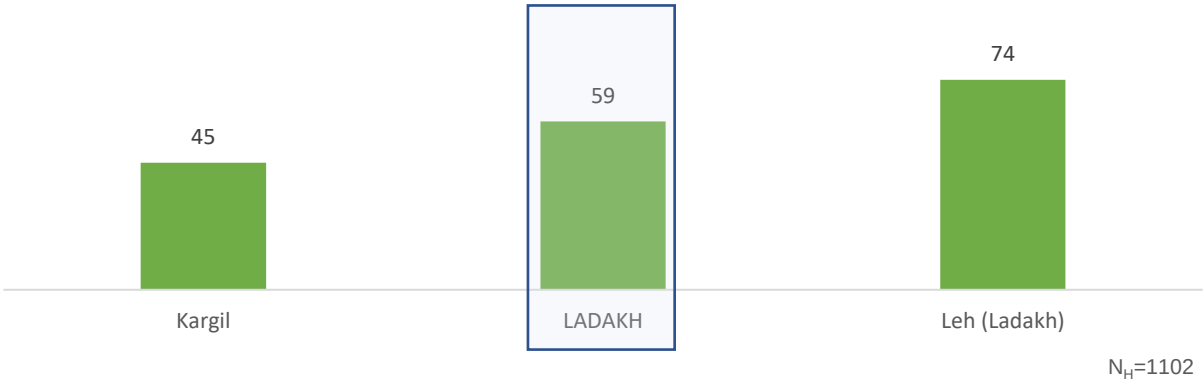
District level comparison across the districts indicate that in Kargil functionality less than the UT average. The district of Leh FHTC provide more than 55 LPCD of water in 59% HHs.

75% HHs in the district of Leh reported to regularly receive water through FHTC. Regular supply of water is less than 50% in none of the districts.

Potability of water was found to be % across both the districts.

B. District wise functionality status

Figure 11: District wise Functionality of HH tap connection

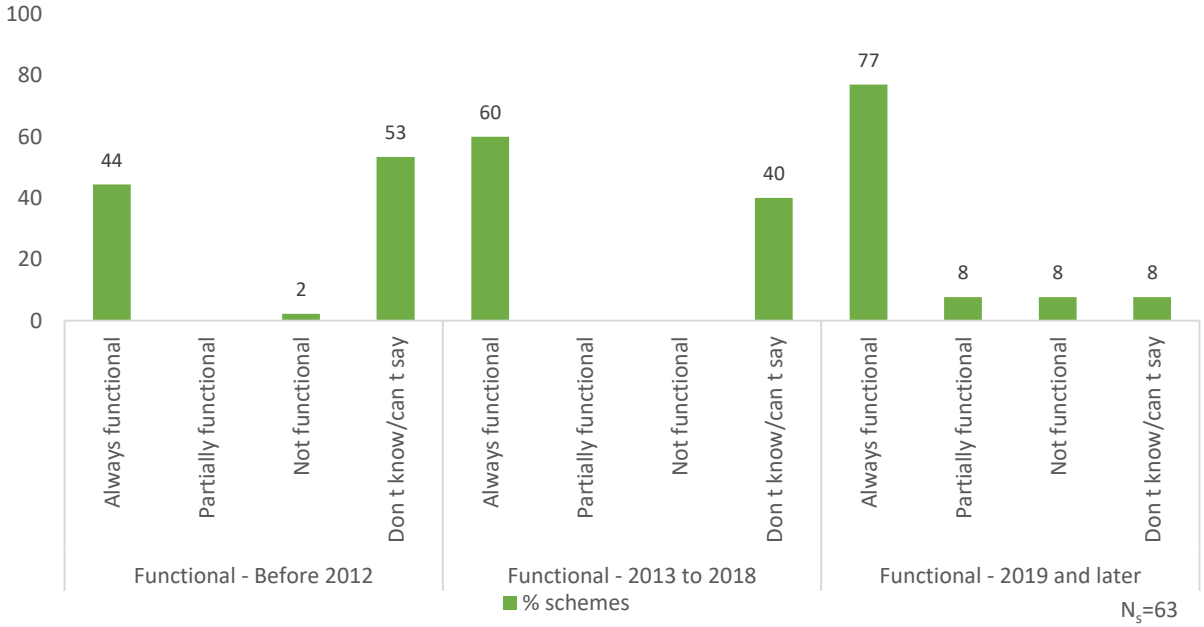


** 'Functionality' has been computed as the intersection of Quantity and Regularity for households wherein water supply was available at the time of survey, i.e., 1102 HHs.*

59% HHs in the UT were found to have functional HH tap water connection. Leh district reported 74% functional households in the UT. In the district of Kargil, about half 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 12: Age vs functionality of schemes in the villages



More than 4 out of 10 schemes are functional since 2012 which reflects a 16-point increase in till 2018 and 17-point increase in 2019 and later.

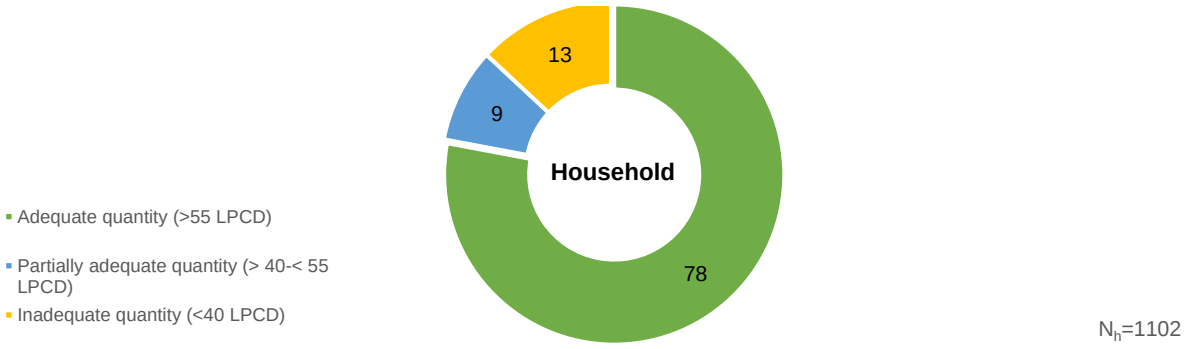
3.2. Quantity, Regularity, and Quality of Water

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)

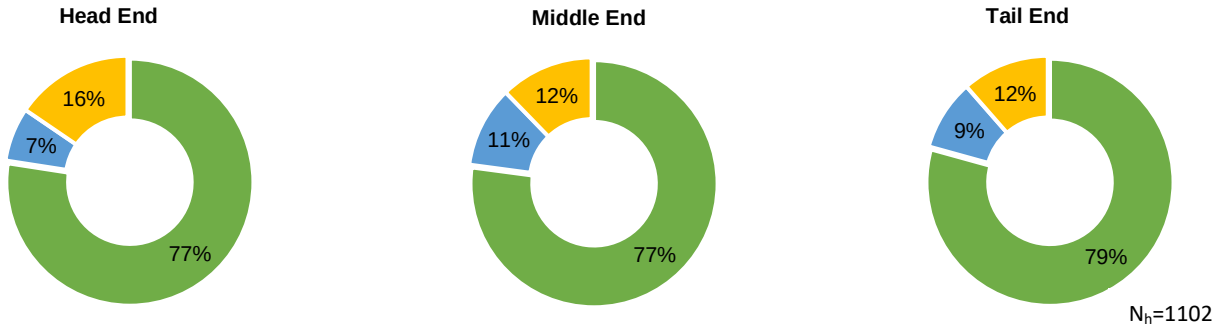
78% HHs reported receiving more than 55 LPCD of water.

Figure 13: Quantity of water received by households



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

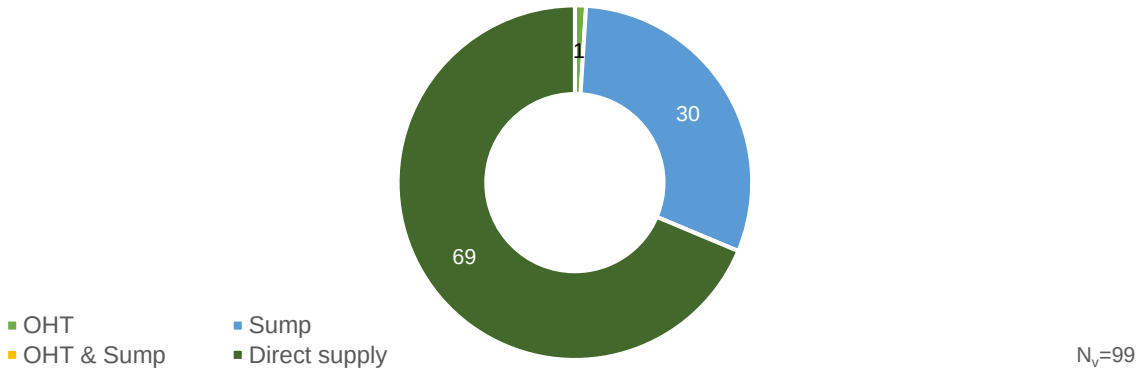
Figure 14: Quantity of water received across head, middle and tail end households



The quantity of water received across the middle, and the tail end was observed to have increased, and about four-fifth (78%) of the sampled households received water in adequate quantity, i.e., greater than or equal to 55 LPCD.

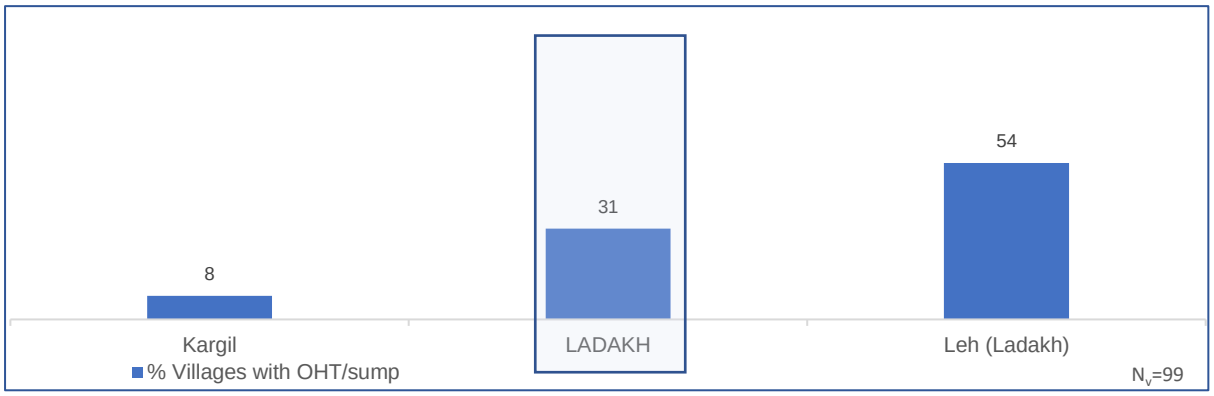
Types of water storage arrangements at village level (in %)

Figure 15: Pipe water supply storage available in village



More than two-third of the respondents in the UT reported water being directly supplied. And in 54% reported water being stored in sump.

Figure 16: District wise water storage arrangements at village level (% villages with OHT/ Sump)

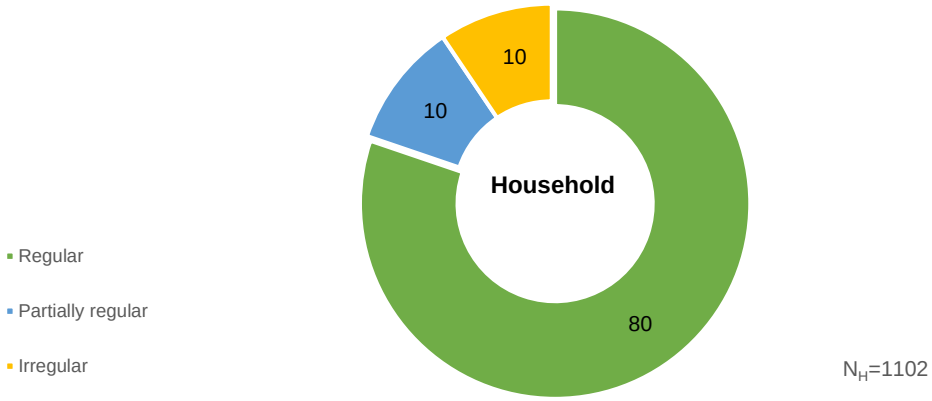


31% villages in the UT have either an OHT or a sump for storing water for supplying to the households. Leh is the district where 54% of the villages have either an OHT or a sump.

B. Regularity of water supply to villages and households

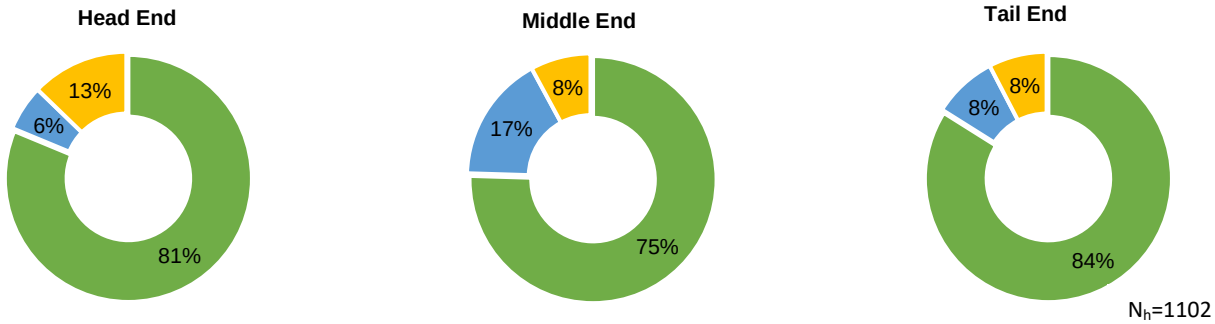
80% HHs receive a regular supply of water (as per agreed schedule)

Figure 17: Regularity of water received by households



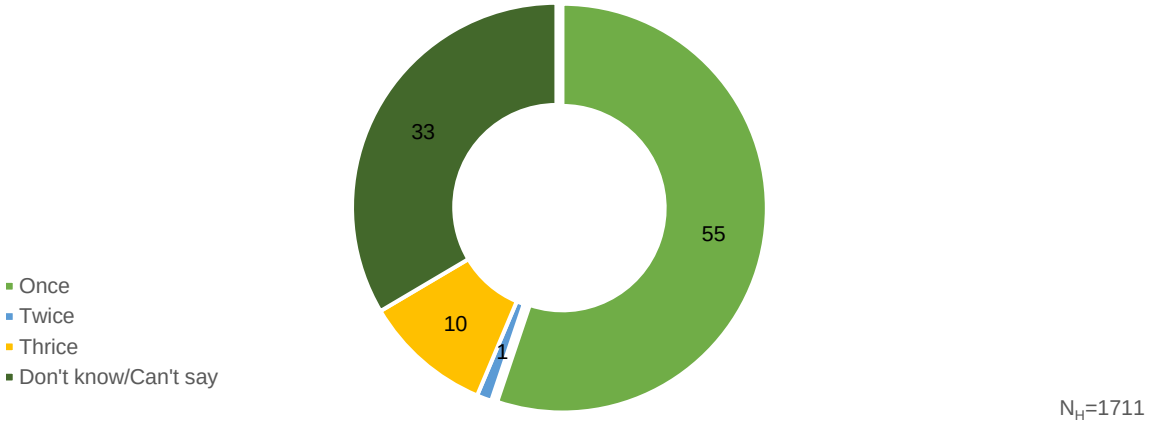
Regularity of water received across head, mid, and tail end

Figure 18: Regularity of water received across head, middle and tail end households



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

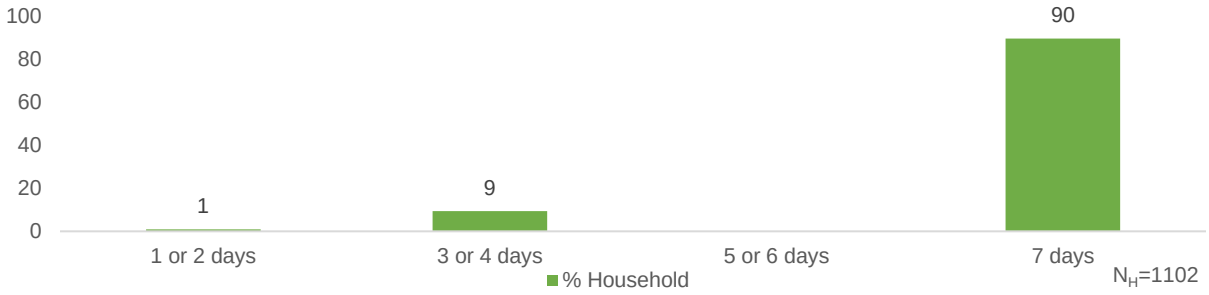
Figure 19: Average no. of times water is supplied in a day



HHs in **55% of districts** receive water once a day. The average duration of water supply across the UT was reported to be **2 hours per day.**

Average water supply days in a week to households

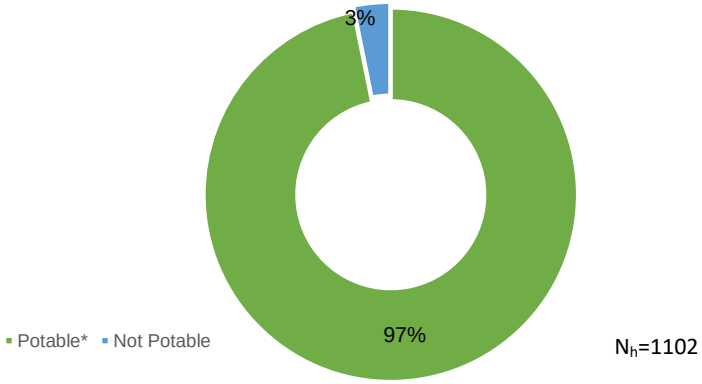
Figure 20: Average number of days households receive water supply in a week (in %)



90% of households receive water all seven days in week.

C. Water quality – Potability

Figure 21: 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 is mentioned in the table given above in the glossary.*

Among the sampled households in Ladakh where water was found on the day of the survey, the potability of water was found to be 97%.

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

Quality Parameters (N_V=99)	Water Samples Tested from Public Institutes			
	AWC	HF	Schools	Others
pH (on-site)	100	100	100	
Turbidity	100	100	100	
Total Hardness	100	100	100	
Total Alkalinity	100	100	100	
Chloride	100	100	100	
Ammonia	Not Tested			
Iron	No History			
Nitrate	100	100	100	
Sulphate	100	100	100	
Total Dissolved Solids	100	100	100	
Bacteriological Test (Absence)	100	100	100	
Fluoride	100	100	100	
Arsenic	No History			

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=1102). 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)	1102	99
Turbidity	983	98
Total Hardness	980	100
Total Alkalinity	982	100
Chloride	951	100
Ammonia	Not Tested	
Iron	No History	
Nitrate	982	100
Sulphate	535	100
Total Dissolved Solids	535	100
Bacteriological Test (Absence)	903	100
Fluoride	No History	
Arsenic	No History	

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

The Residual Chlorine (RC) in the state of Ladakh was found in none of the samples. 100% of water samples passed the bacteriological contamination test. While in none of the samples bacteriological contamination is found.

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. 1164 water samples were submitted, and 1017 water samples were tested, and reports made available. The turnaround time for testing was more than 48 hours in most cases.

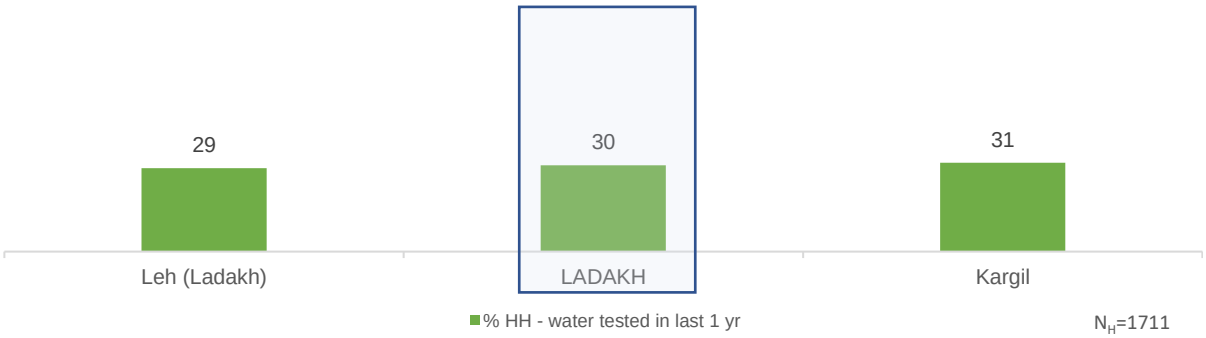
Table No. 6: Performance of Labs

Sl. No	District	Lab available	HH surveyed	Samples submitted	Report received	Overall lab experience
1	Leh (Ladakh)	Yes	850	586	568	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	Kargil	Yes	861	578	449	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

30% of HHs reported that their HH tap-water was collected and tested in the last one year.

Figure 22: Households where tap water was tested in the last one year



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

Schemes reported to have faced challenge in village

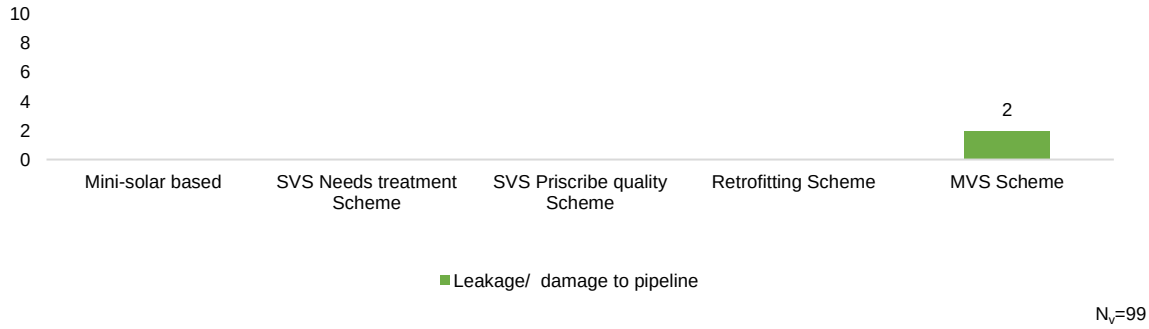
The Mini Solar scheme faced the most challenges (2%) in comparison to the other schemes in the state.

Figure 23: 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.

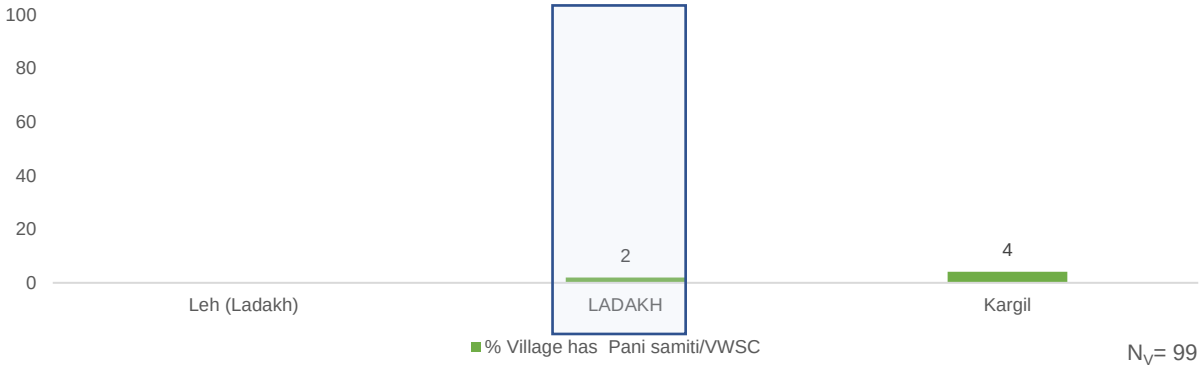
Figure 24: Type of challenge faced by the schemes



A. Presence of VWSC/Pani Samiti

2% of villages in the UT reported to have a VWSC or a Pani Samiti.

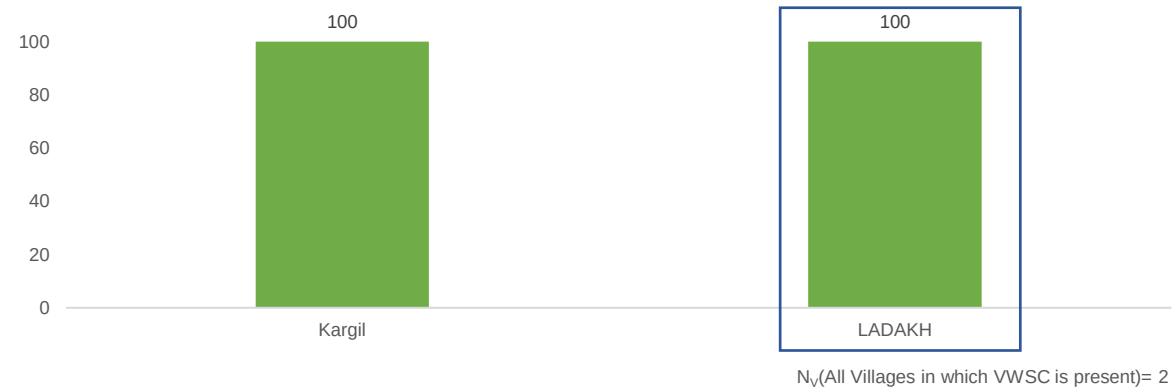
Figure 25: Villages where VWSC/ Pani Samiti is present



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

All of the VWSC/Pani Samitis in Ladakh were having more than 50% female members.

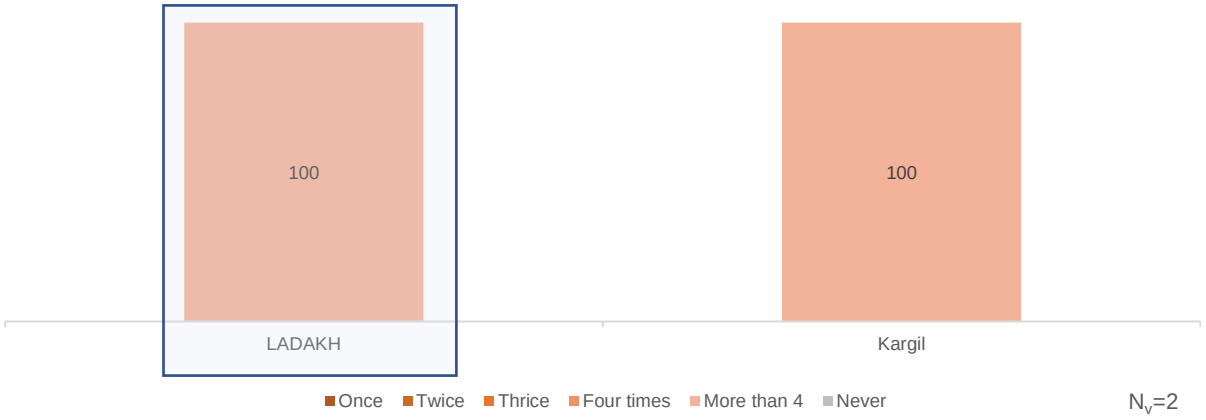
Figure 26: VWSC/ Pani Samiti with more than 50 percent female members



C. VWSC Meetings in last one year

Across the villages in the UT, that reported to have VWSC/Pani Samitis (2 villages), more than 4 meetings in last one year was reported the most (100%)

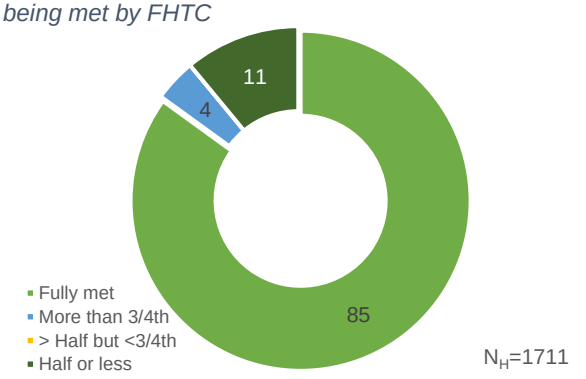
Figure 27: VWSC meetings held in last one year



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

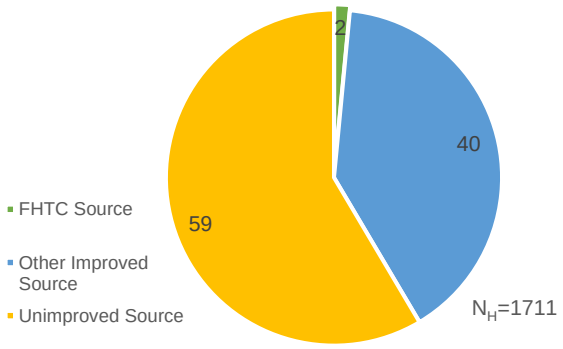
85% of HHs reported that their daily requirement of water was being met by HH tap connections

Figure 28: Daily household's requirement of water being met by FHTC



40% HHs reported HH tap connections as their primary source of drinking water

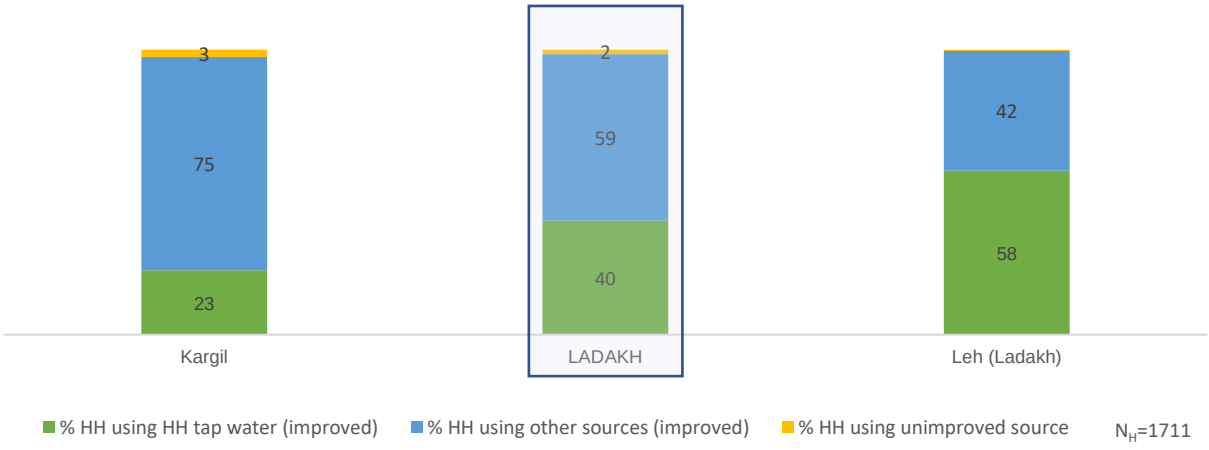
Figure 29: Households reported FHTC as primary source of drinking water



More than 4 out of 5 (85%) HHs reported their daily requirement of water being fully met by the HH tap connections. And 40% HHs reported used household tap connection for drinking water (primary source). About 59% of the HHs even though have reported household tap connections to fully meet their requirements, were not found using the same for drinking purposes.

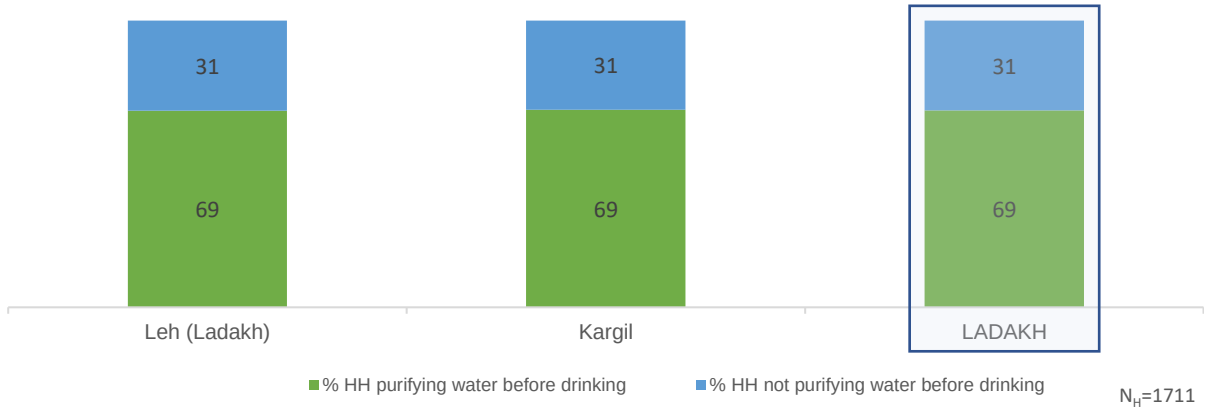
Overall, **98% of HHs** reported using improved primary source of drinking water, out of which **40% of HHs** reported HH tap water as their primary source.

Figure 30: District wise distribution of household's reported FHTC as primary source of drinking water



A. Households who practice purifying of water before drinking

Figure 31: Households who practice of purifying water before drinking

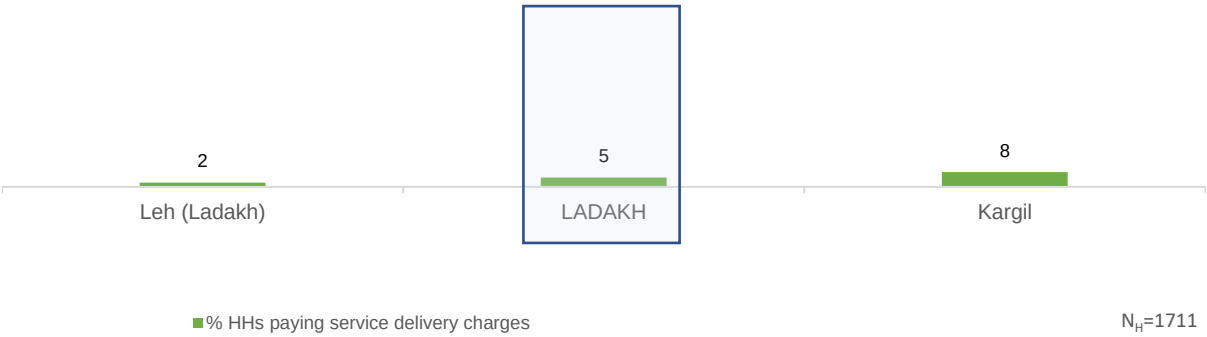


Practice of purifying water before drinking was reported the equally in both the districts where 69% HHs reported using HH tap water as primary drinking water source.

B. Households paying water service delivery charges

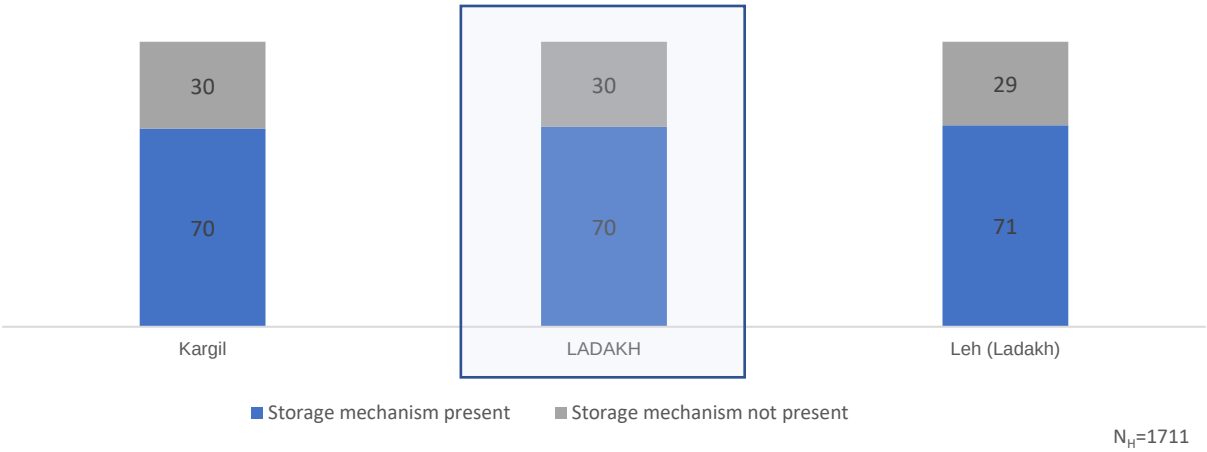
In Ladakh, around 5% of the sampled households were found to be paying service delivery charges, Kargil being the district with the highest percentage of such households (8%).

Figure 32: Households paying water service delivery charges



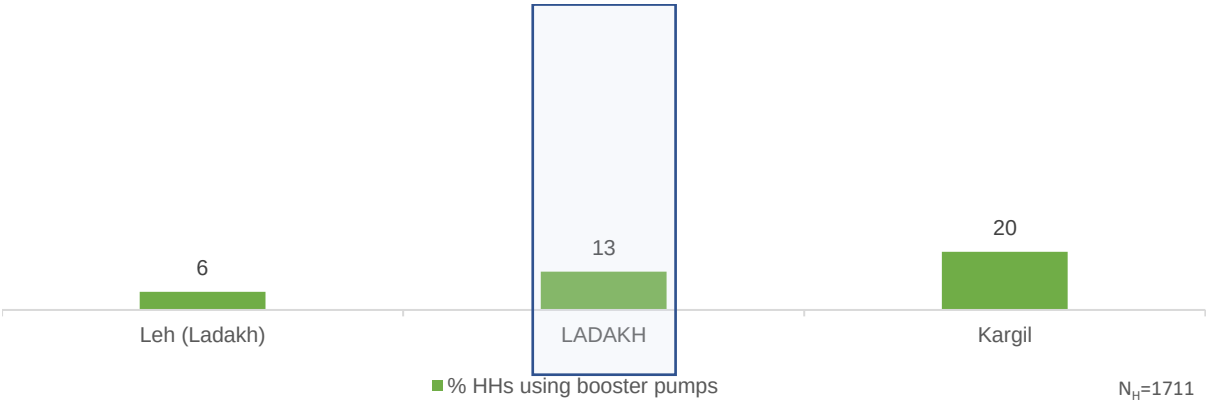
C. Storage mechanism used by households

Figure 33: Households having storage mechanisms



D. Households using booster pumps

Figure 34: Households reported to use of booster pumps

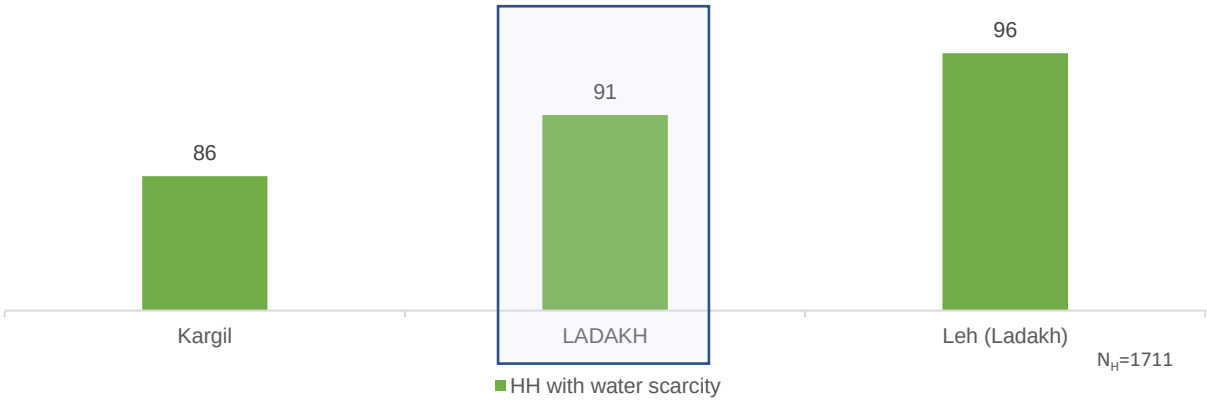


Overall, **13% HHs** reported using booster pumps to maximize the water flow through their piped water connections. Kargil reported 20% of HHs using booster pump in the UT while Leh reported only 6%

E. Households who faced scarcity of water

In the UT, **91% HHs** faced shortage of water during any time of the year, while **86% HHs** reported having some mechanism to cope with scarcity of water.

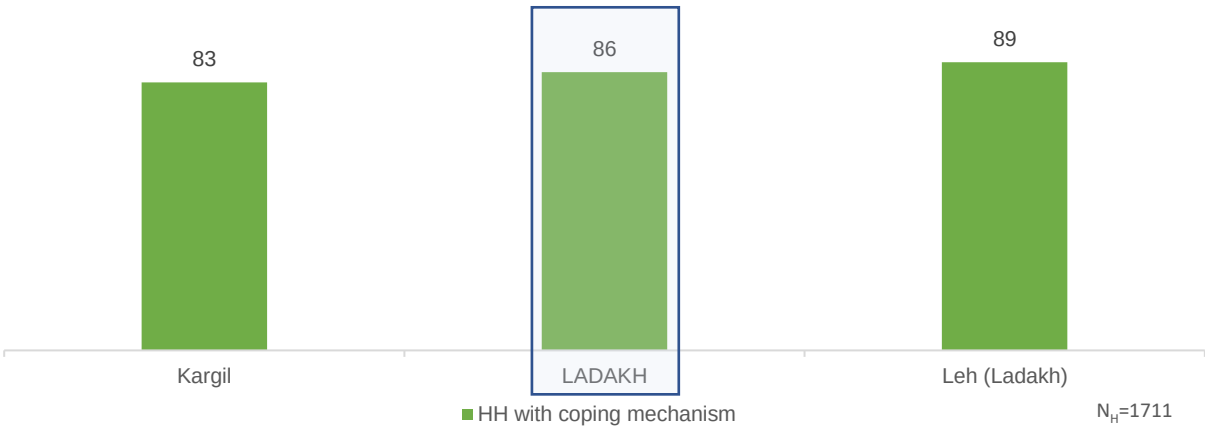
Figure 35: Households who faced water scarcity



F. Household with a mechanism to cope water scarcity

86% HHs reported having some mechanism to cope with scarcity of water.

Figure 36: Households reported to have some mechanism to cope with scarcity of water

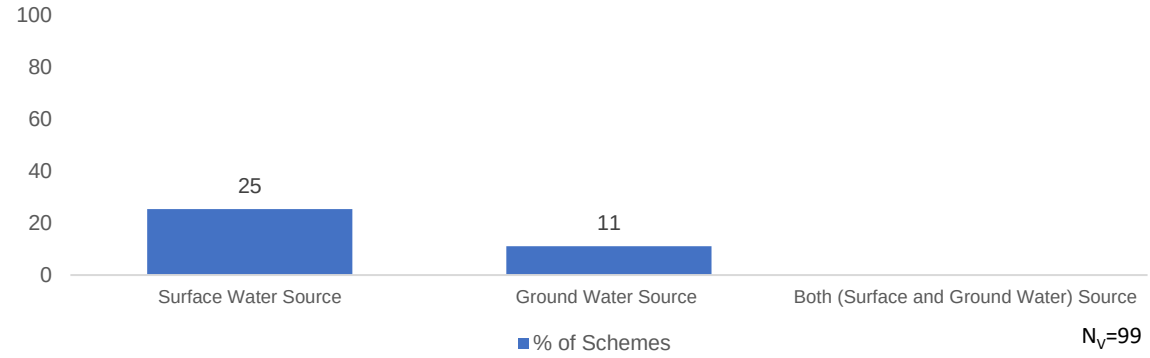


3.5. Source sustainability at the village level

Schemes based on surface and ground water

25% of schemes reported to be based on surface water source while **11% of schemes** reported to be based of ground water sources

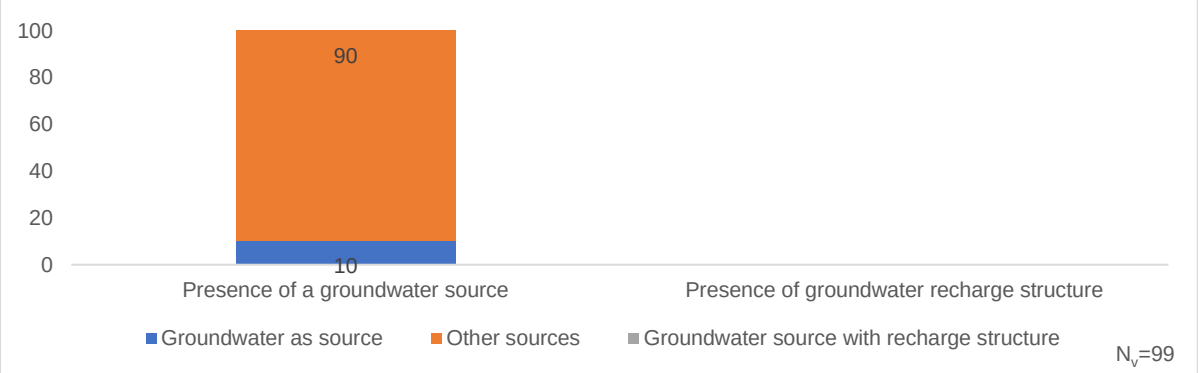
Figure 37: Schemes based on water source in village



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

Presence of a groundwater source and groundwater recharging structure

Figure 38: Villages reported the presence of groundwater sources and among those how many reported to have a recharge structure

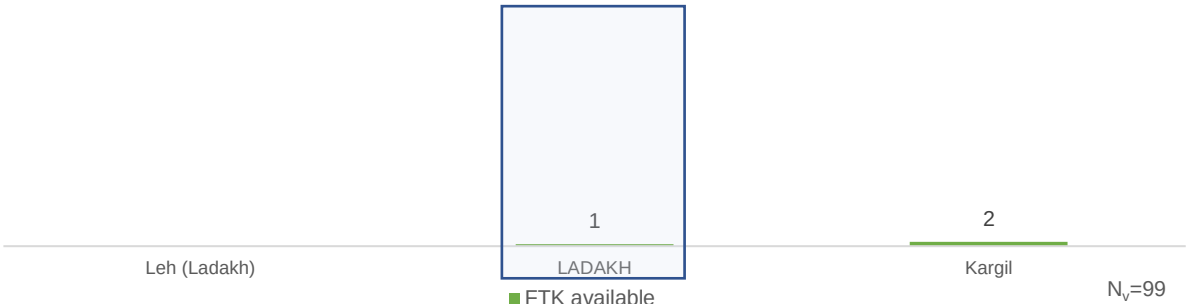


In the UT, **10% villages** reported the presence of groundwater sources like improved dug wells and borewells. Out of which, 0% of villages reported (i.e., 0 villages) reported having a recharge structure.

3.6. Water quality monitoring and surveillance in the villages

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

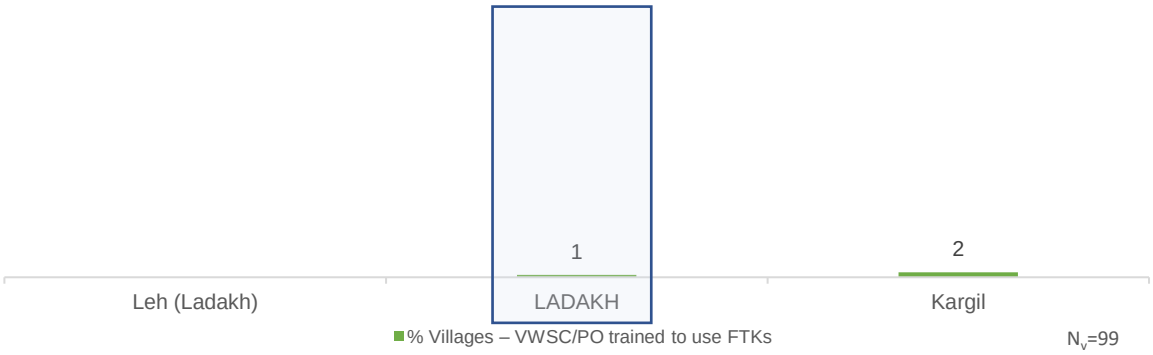
Figure 39: Availability of field test kits with VWSC/ Pani Samiti



With regards to water quality testing in the village by VWSC, 1% villages in the UT reported having available field test kits. Kargil reported 2% villages having available field test kits for water quality testing, while Leh reported 0%.

B. Persons trained to use field test kits

Figure 40: Persons trained to use field test kits

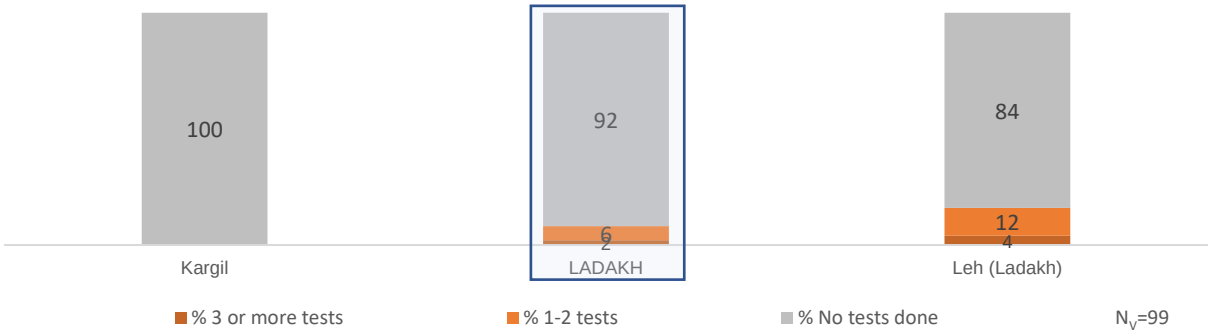


Overall, **1% of villages** in the UT reported to have either VWSC/Pani Samiti or pump operator trained to use field test kits for testing the quality of water on-site. Kargil reported 2% VWSC/Pani Samiti or pump operator trained to use field test kits while Leh reported 0%.

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

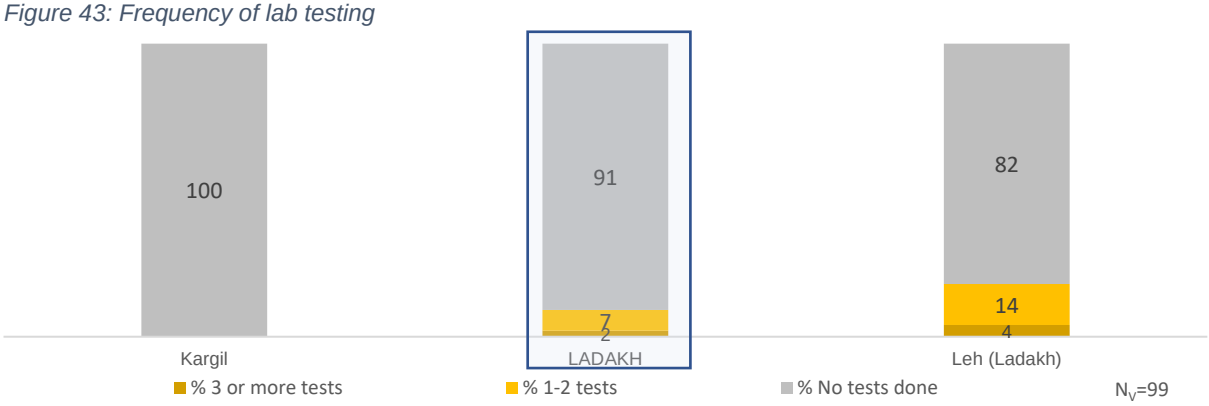
Across the UT, 2% of the total sampled villages reported that the quality of water (at different points in the respective villages) was checked at least three times using FTKs in last one year. Among the districts, Leh had the highest proportion of such villages, wherein 4% of its villages reported using 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

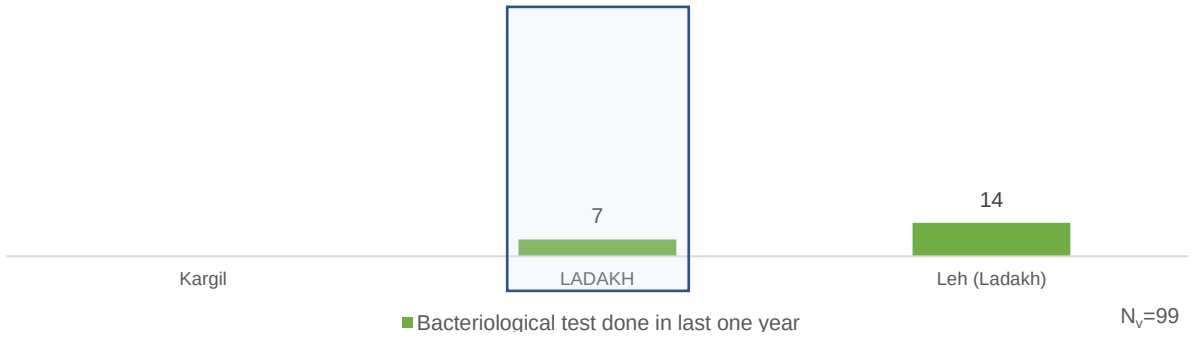


Across the UT, 2% of the total sampled villages reported that the quality of water (at different points in the respective villages) was checked at least three times through laboratories in last one year. Among the districts, Leh had the highest proportion of such villages, wherein 4% of its villages 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, **7% villages** in the UT reported having bacteriological test done in the last one year.

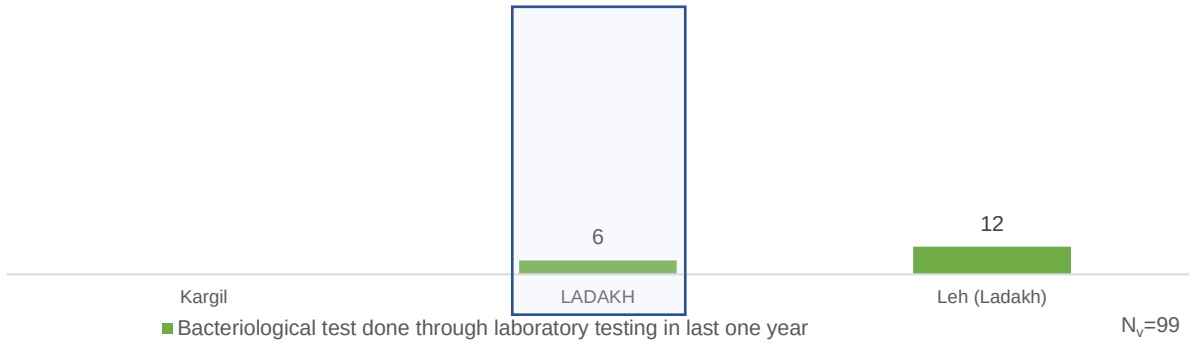
Figure 44: Percent villages in which Bacteriological test was done in the last one year



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

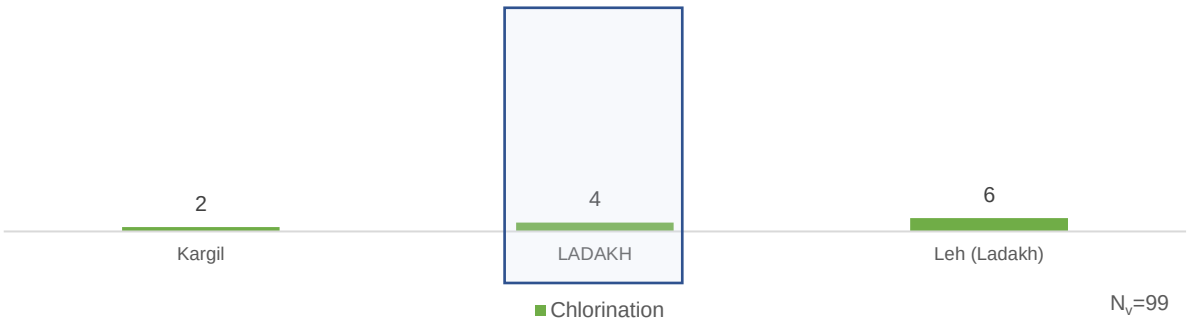
Laboratory based bacteriological tests, in last one year, was reported by 6% of sampled villages. 12% sampled villages from the district Leh reported to have had bacteriological tests done through laboratories in last one year.

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

Figure 46: Villages having a mechanism for chlorination

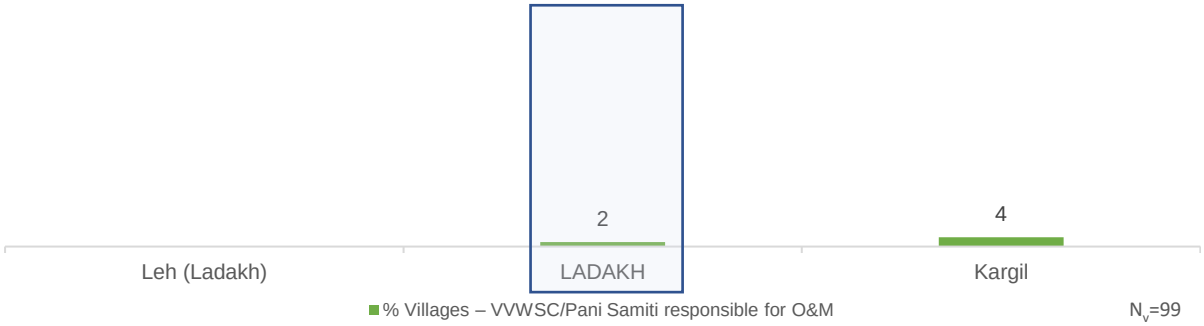


More than **4% villages** reported that there is availability of chlorination mechanism in the village but during onsite testing of water at household level no households tested to have for presence of chlorine.

3.7. Management of water service delivery at village level

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

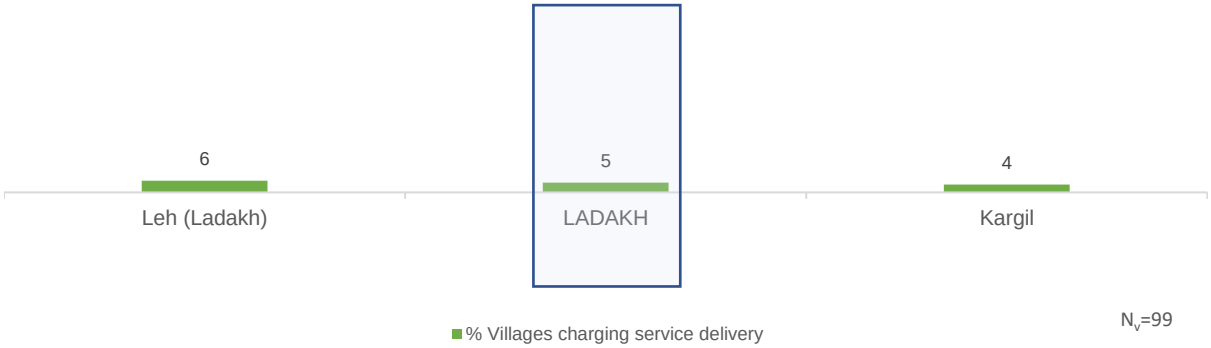
Figure 47: VWSC/Pani Samiti responsibility for O&M of PWS schemes



In the UT, **2% villages** that have VWSC/Pani Samiti reported to be responsible for operation and maintenance of PWS. Leh district reported that VWSC/Pani Samiti are not responsible for operation and maintenance of PWS.

B. Villages levying water service delivery charges from households

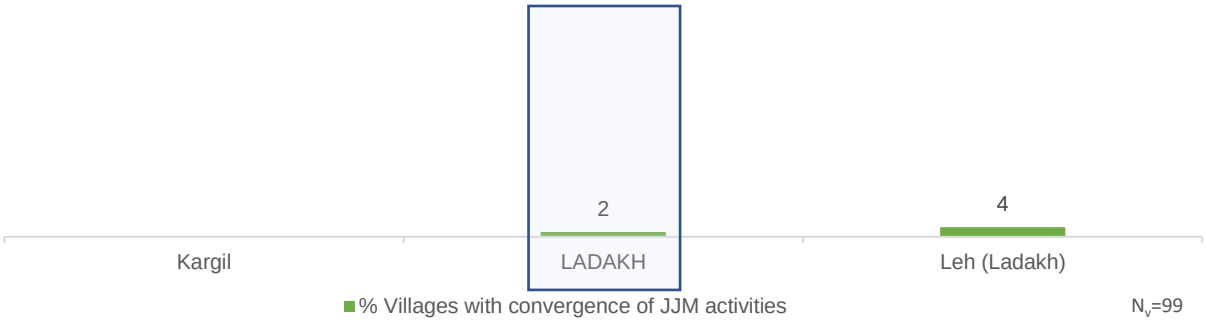
Figure 48: Villages levying water service delivery charges from households



Overall, **5% of villages** in the UT levy charge for water service delivery to households whereas **5% 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 UT, only **2% villages** in the UT reported convergence of activities under JJM with other government programmes/ schemes on skill development, capacity building and training, and awareness generation.

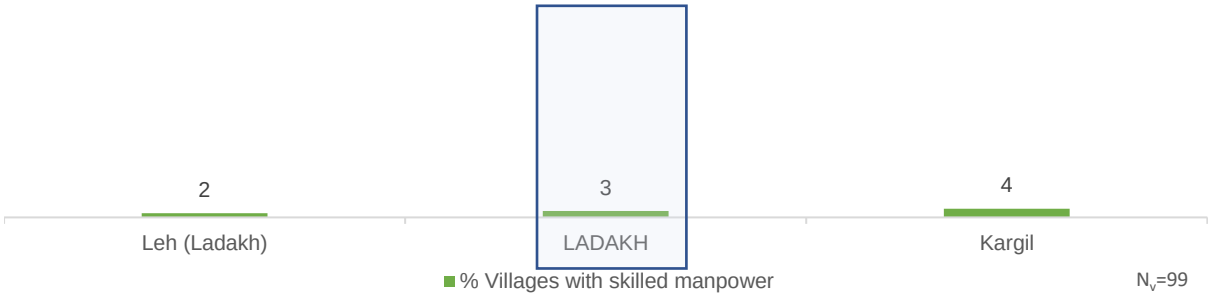
D. Villages where signages were observed

Signages about JJM were observed **in none of the sampled villages**.

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 UT, **3% villages** in the reported having identified skilled manpower for O&M of PWS schemes, the most reported to be in Kargil (4%) and the least in Leh (2%).

B. Villages with O&M challenges

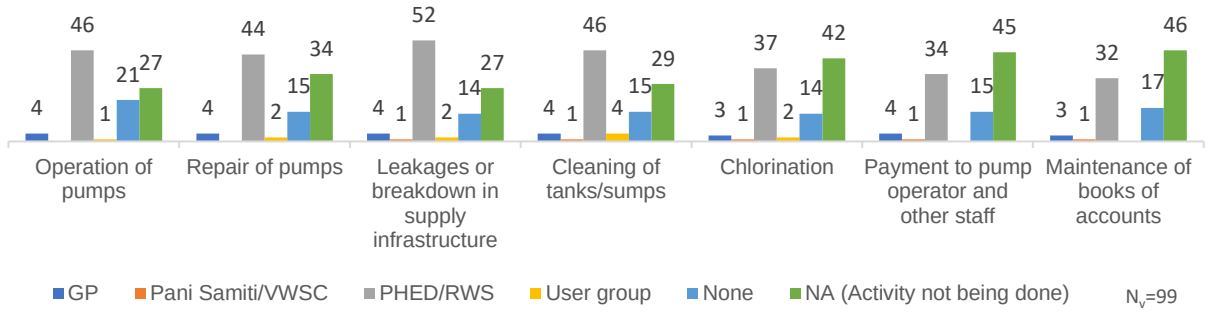
In the UT, **none of the villages** in the UT reported to have faced challenges with respect to O&M of PWS schemes.

C. Details of challenges faced

No village faced any challenges.

D. Responsible for O&M

Figure 54: Different bodies responsible for O&M



Across the UT, villages reported 'PHED' 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

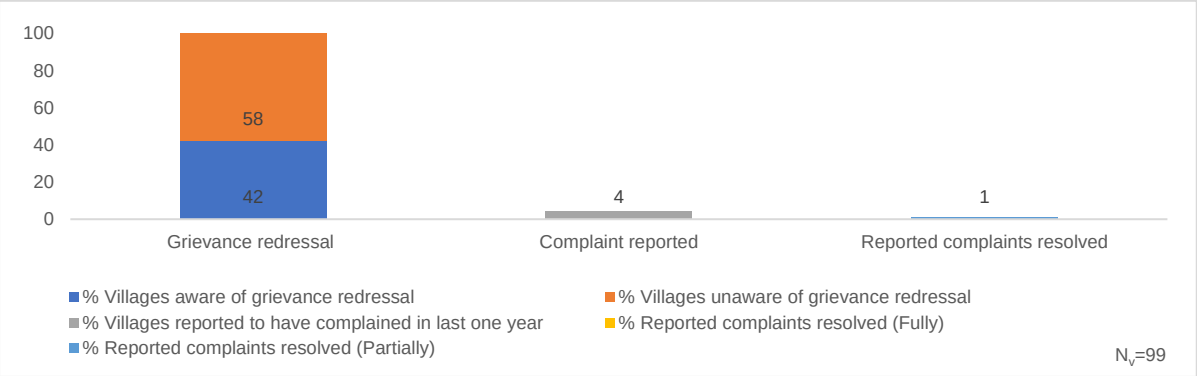
None of the villages in the UT reported to have community level monitoring of water wastage.

3.9. Status of service delivery related grievances and redressal

A. Village level

Grievance redressal at village

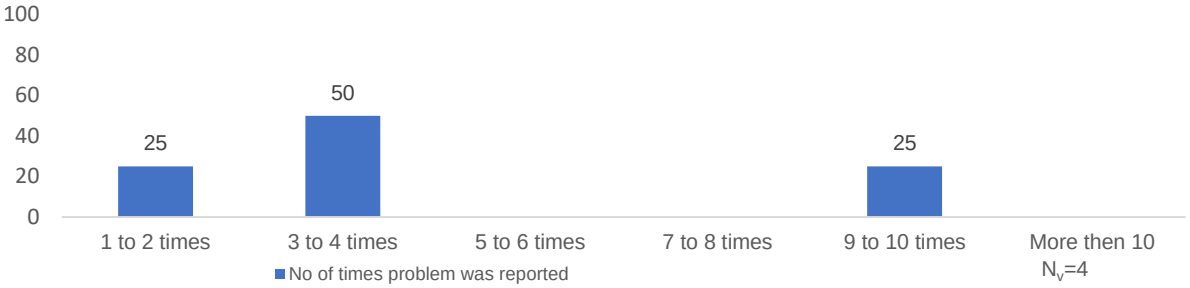
Figure 56: Reporting of grievance redressal at village level



In the UT, **42% of villages** reported that they are aware of any grievance redressal mechanism, but only 4% HHs have reported a complaint in the last one year amongst which 0% reported that the complaints are fully resolved while 1% 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

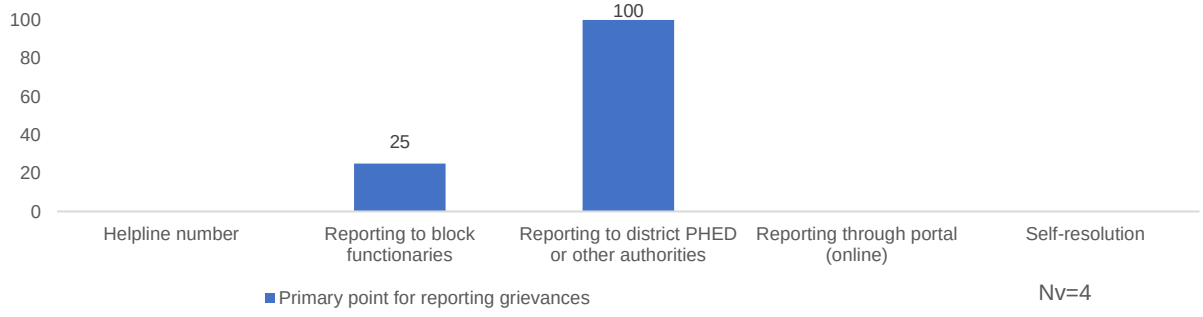


Among the villages who reported a complaint (i.e., 4 villages), 0% villages have reported a complaint more than 10 times in the last one year, while 50% reported a complaint at least three to four times.

Primary points for reporting grievances

Among those who reported complaint (i.e., 4% HHs, 4 villages), **100% of villages** reported that they report their grievances to **PHED** beside other reporting-points.

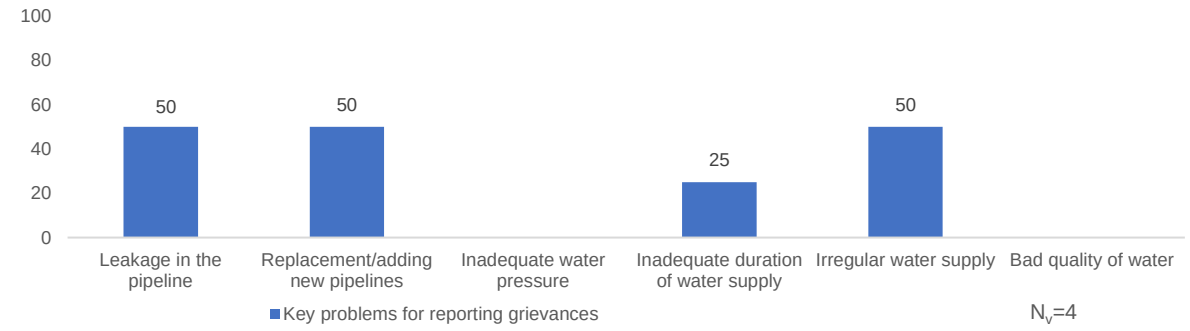
Figure 58: Primary points for reporting grievances by village



Key problems for reporting grievances

Overall, among those who reported complaint (i.e., 4% HHs, 4 villages) **85% of villages** reported that **leakage in the pipeline, irregular water supply, and replacement/aiding new pipelines** is their most encountered problem for reporting grievances

Figure 59: Key problems reported by village

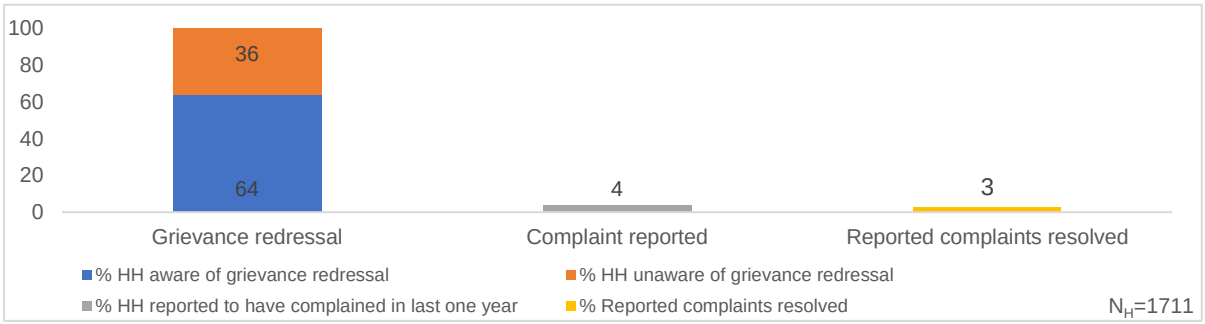


B. Household level

Awareness of grievance redressal at household

In the UT, **64% of HHs** reported that they are aware of any grievance redressal mechanism w.r.t. HH tap water through PWS, but only 4% HHs have reported a complaint in the last one year and only 3% of complaints have been resolved.

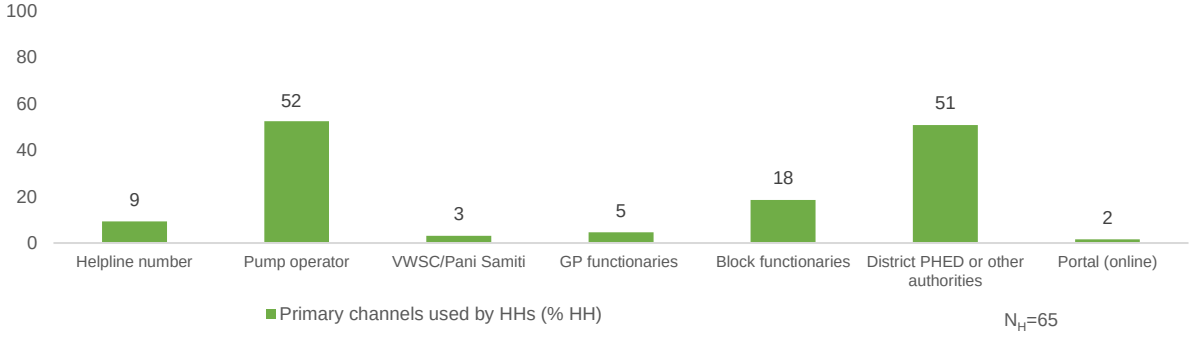
Figure 60: Reporting of grievance redressal at household level



Primary channels for reporting grievances by households

Among those who reported complaint as shown in the above graph (i.e., 4% HHs, 65 HHs), **52%** of the HHs reported their complaints to the **pump operators** beside other reporting-channels.

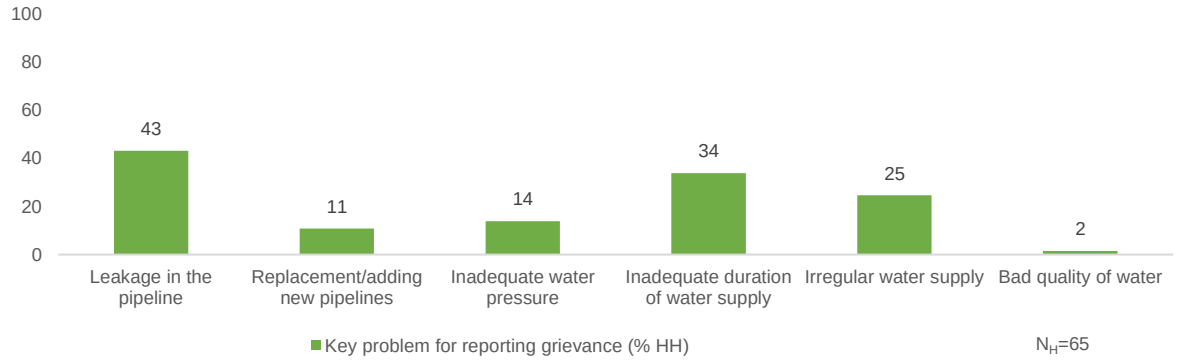
Figure 61: Primary channels for reporting grievances by households



Key problems for reporting grievances

Overall, among those who reported complaint (i.e., 4% HHs, 65 HHs) **43%** of the HHs that reported problems was of **leakage in the pipeline** beside other problems.

Figure 62: Key problems reported by households

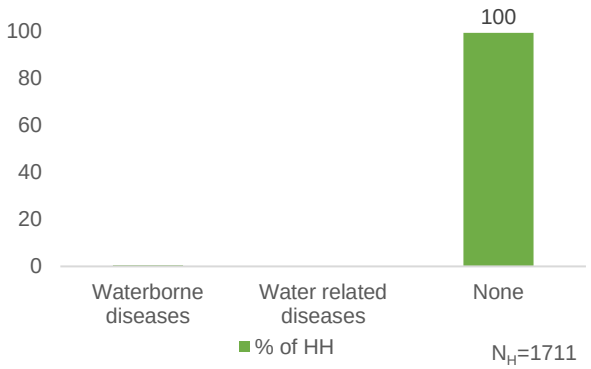


3.10. Perception of HHs on Outcome Indicators

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

Across the state none of the 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

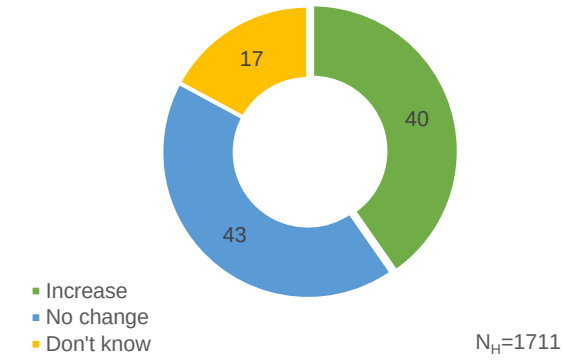
Figure 64: Household reported incidence of water borne diseases in last one year



B. Change in employment days since FHTC programmes/schemes

Since having a functional HH tap connection, 40% HHs across the state has reported that there has been a change in the no. of employment days of the adult HH members while 43% HHs reported no change

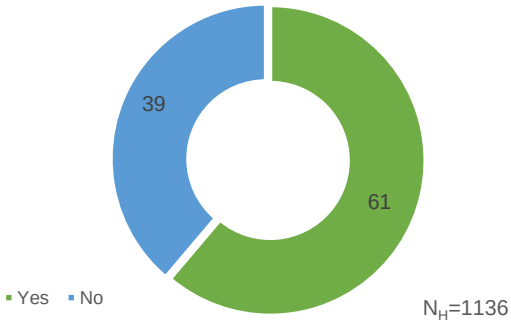
Figure 63: Household reported a change in employment days since FHTC programmes /schemes



C. Reduction in time and effort in collecting water

Out of the HHs reported (i.e. 1136) that female members used to fetch water before HH tap connection, 61% reported that post installation of HH tap connection it helped reduction of time and effort in collection of water

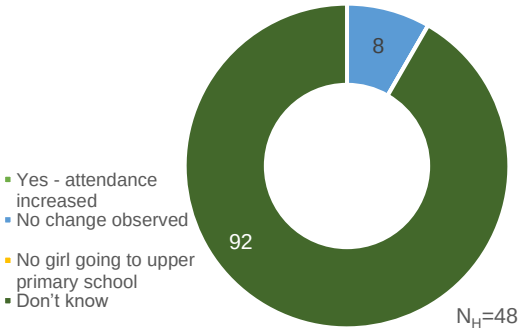
Figure 66: Households reported reduction in time and effort in collecting water



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

Across the state, no HHs reported that since having a functional HH tap connection the attendance of the girls going to schools increased, while 8% 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

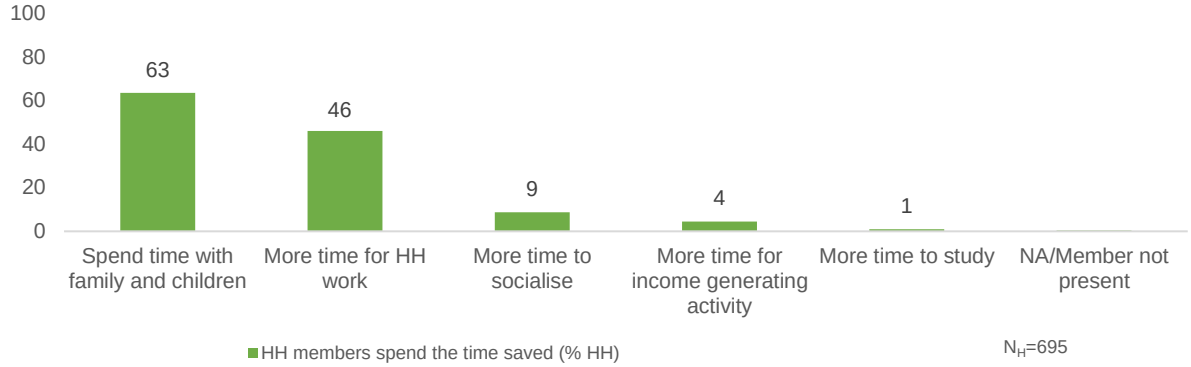
Figure 65: Households reported increase of attendance of girls going to upper primary school



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 to spend time with family and children (63%).

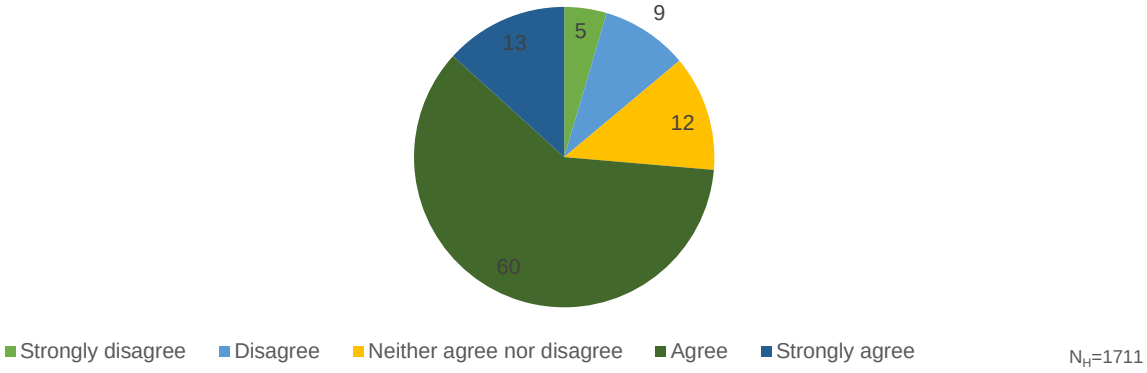
Figure 67: Utilization of time saved by households post installation of HH tap connection



F. Change in social status

Sense of pride and positive change in social status was reportedly realized by 13% of HHs post the installation of HH tap connections.

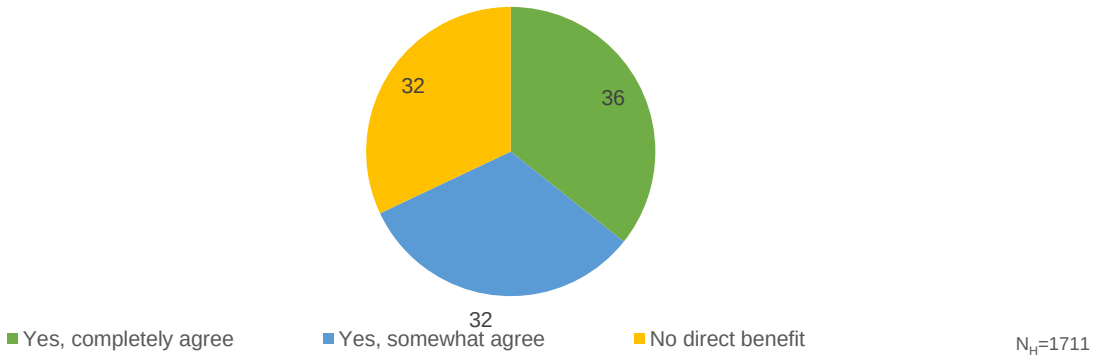
Figure 68: Households reported to have a positive change in social status



G. Direct benefits in terms of income due to FHTC

Across the UT, 36% 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 32% 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

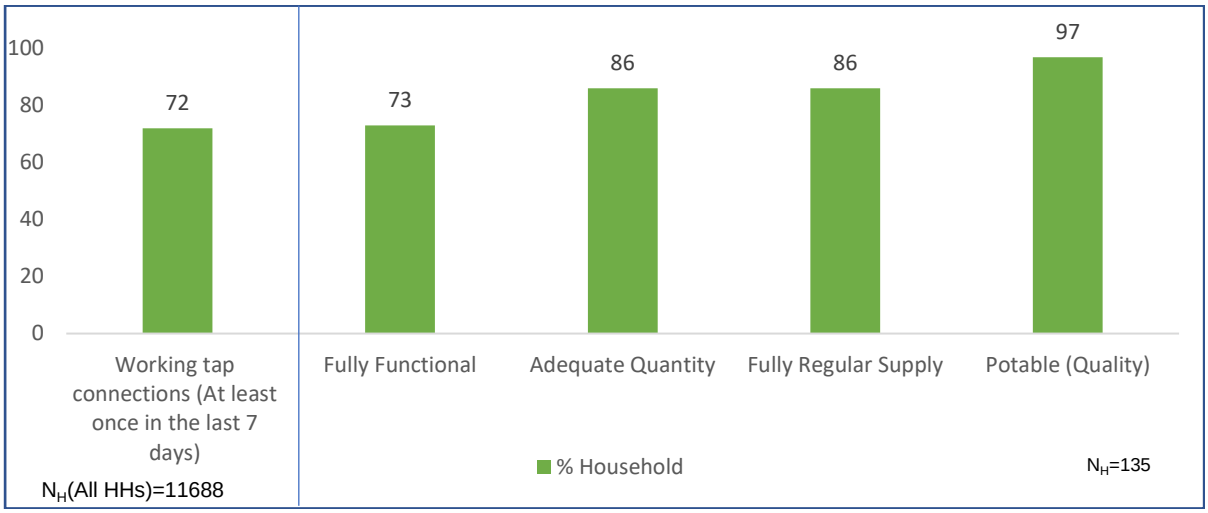
Table No. 7: User satisfaction - more than 75% happy with FHTC services			
S. No.	**Parameter (N_h=1711)**		**In%**
1	Regularity		65.2
2	Overall quality		74.5
3	Colour		76.2
4	Taste		77.1
5	Odour		75.9

Note:
Base (N_v)=99 means all villages sampled and covered in UT of Ladakh
Base (N_H)=1711 means all households sampled and covered across the 99 villages in UT of Ladakh
Base (N_H)=1102 means all households sampled where water sample be collected across the 99 villages in UT of Ladakh
Base (N_H)=1136 means all households sampled where female members used to fetch water before HH tap connection
Base (N_H)=48 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 villages

4.1. Overall Functionality (in %)

Figure 70: Functionality of HH tap connection for HGJ villages



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

Please note: For HGJ district, N_H=135 implies all HHs where water was found on the day of the survey.

It has been found that 72 percent of the sampled HHs (N=135) had working tap connections. 73 percent HHs in the state were found to have fully functional HH tap water connection. More than four-fifth of the households (86 percent) received adequate quantity (>=55 LPCD) of water supply and more than 4 out of 5 received regular supply (86 percent) of water. The on-site testing and lab test results of the water indicates that more than 9 out of 10 (97%) sampled households in the state receive potable water.

Table No. 8: Quantity, Regularity, and Quality of FHTC for Har Ghar Jal 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.	Kargil	69	43	51	84	100
2.	**Ladakh**	**72**	**73**	**86**	**86**	**97**
3.	Leh (Ladakh)	74	84	99	87	96

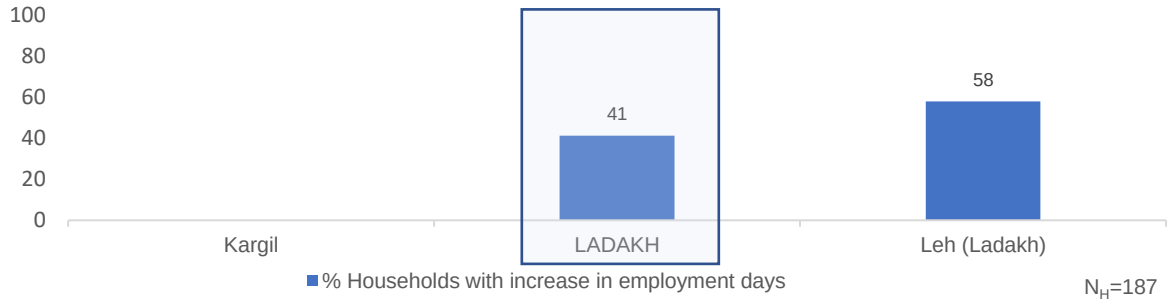
Potable water has been considered basis testing of water samples through laboratory tests for physical, chemical, and bacteriological as given in Table 5 parameters (within acceptable/ permissible range) and onsite testing of pH. The details of laboratory test are mentioned in the table given above in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

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

A. Change in employment days since FHTC programmes/ schemes

Across the UT, two-fifth (41%) of the sampled households reported that employment days increased since the installation of FHTC.

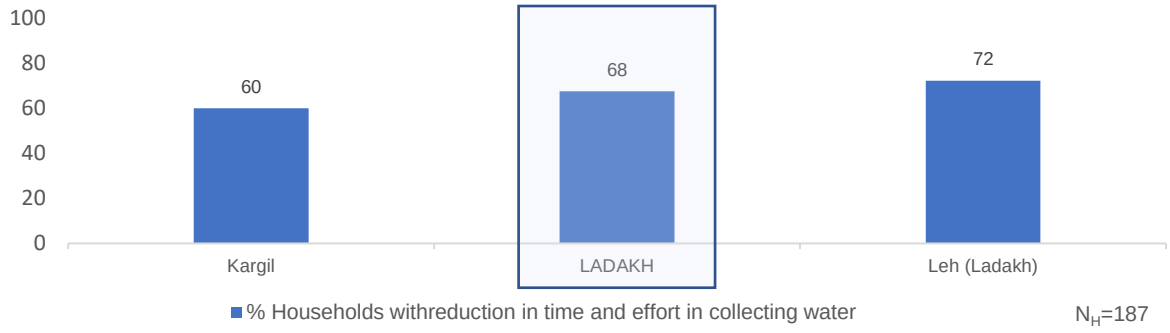
Figure 71: Household reported a change in employment days since FHTC programmes /schemes in HGJ districts



B. Reduction in time and effort in collecting water

Similarly, about 68% of the sampled households also reported that the effort and time in collecting water reduced after installation of FHTC.

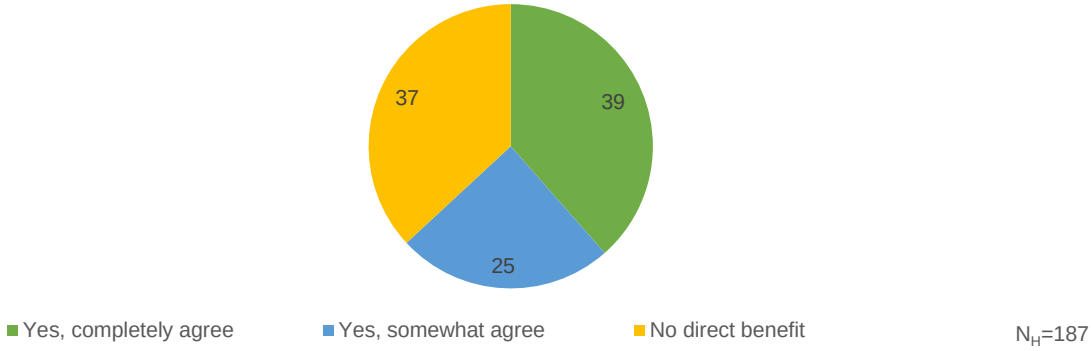
Figure 72: Households reported reduction in time and effort in collecting water in HGJ districts



4.3. Direct benefits in terms of income due to FHTC

Across the UT, 39% 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 25% reported being in partial agreement against the same.

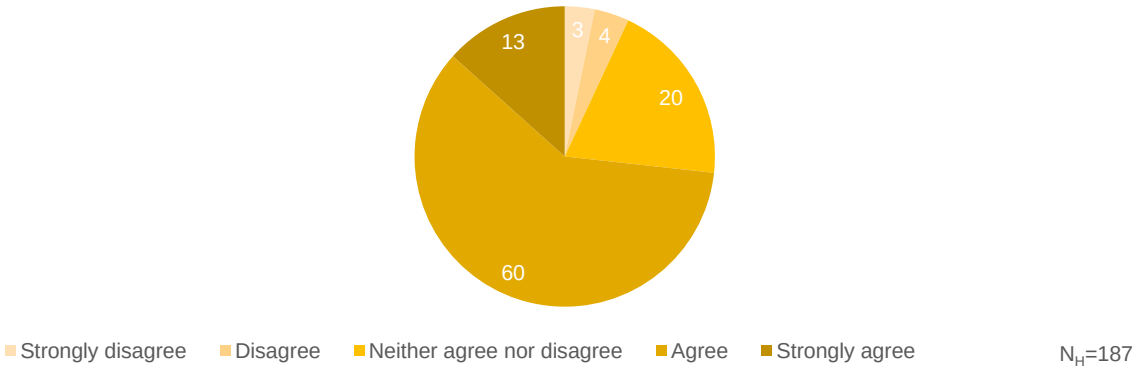
Figure 73: Households reported to have received direct benefits in terms of income due to FHTC in HGJ districts



4.4. Change in social status

Almost three-fourth 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 HGJ districts



5. Annexure

Table No. 9: List of replaced villages

S. No.	District Name	Village Name	Status of the Scheme (No Scheme/Replaced & Defunct)	Remarks
1	Leh (Ladakh)	Lingshed	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Stakna. Scheme found to be functional in replacement village
2	Leh (Ladakh)	Tar Hipti	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Temisgam. Scheme found to be functional in replacement village
3	Leh (Ladakh)	Tangtsi	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Chochut Shamma. Scheme found to be functional in replacement village
4	Kargil	Padum	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Purtikchey. Scheme found to be functional in replacement village
5	Leh (Ladakh)	Achinathang	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Umla. Scheme found to be defunct in replacement village
6	Kargil	Tacha Khasar	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Chowkiyal. Scheme found to be functional in replacement village
7	Kargil	Remala/Skygam	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Minji. Scheme found to be functional in replacement village