



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



STATE REPORT: TAMIL NADU
SURVEY DURATION: MARCH TO APRIL 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	≥ 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

- Mini-solar based piped water supply scheme in isolated/tribal hamlets
- Single Village Scheme (SVS) in villages having adequate groundwater that needs treatment
- Single village scheme (having adequate groundwater/ spring water/ local or surface water source of prescribed Quality)
- 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
- 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 Tamil Nadu lies in the southern part of India and has a population of 7,21,47,030 (Census 2011). It has 36 districts and 12525 villages, and 11844 villages have PWS schemes. The state is yet to achieve the Har Ghar Jal status. A total of 415 villages, across all districts, and 13922 households were randomly sampled for the survey, and additionally, water samples from 987 public institutions were tested.

In the assessment among sampled villages, 41% of villages have only one scheme, 26% of villages have 2-3 schemes, and 31% of villages have 4 and more schemes. Mostly all schemes across the state were found functional.

At the state level, 93% of the HHs were satisfied with the regularity of the supply, 91% with the quality of the water supplied, 95% with the colour of the water supplied, and 89% with the taste of the supplied tap water.

Overall functionality status of Tamil Nadu

At the state level, 100% of HHs received water on the day of the survey. While 86% of the HHs were found to have fully functional tap water connections within the premises. Out of which 94% received an adequate quantity of water, 93% reported receiving a fully regular supply of water, and 97% HHs received potable water.

It was found that more than 74% of households received water all 7 days a week and 19% received at least 3 to 4 days, while none of the HHs received water only once a week. The average duration of water supply across the state was reported to be 2 hours per day.

In Tamil Nadu, 2% of the villages have reported that water is directly supplied to the households and the remaining 98% 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 Tamil Nadu, 14850 samples of water were submitted, and 8114 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 52% of the HHs. The percentage was relatively higher in AWCs, and schools (more than 25%), wherein there is a possibility of additional chlorine being added locally for the purification of water. Even if 99% of samples passed in bacteriological parameter the RC was found only in 1%, which means the protection against the risk of bacteriological contamination from source to point of consumption is not provided to HHs.

Out of the 13922 HHs sampled for the FHTC assessment, a water quality test was carried out in 13863 due to the non-availability of water in few HHs on the day of the survey. pH was found within the acceptable limit in 98% of households. Among the public institution, pH was found in the acceptable limit of more than 99% in HF.

32% of villages in the state reported having available field test kits. And 62% 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 41% of villages in the state reported having a VWSC or a Pani Samiti out of which 67% of the VWSC/Pani Samitis reported to have more than 50% female members. In the state, 13% of villages reported that VWSC/ Pani Samiti is responsible for the operation and maintenance of pipe water supply.

48% of villages reported having identified skilled manpower for O&M of PWS schemes. 0.5% of villages in the state reported having faced challenges with respect to O&M of PWS schemes.

93% of HHs reported that they are aware of any grievance redressal mechanism w.r.t. HH tap water through PWS, but only 3% HHs have reported a complaint in the last year and only 2% of complaints have been resolved. Among those who reported complaints (i.e., 3% HHs, 255 HHs), 75% of the HHs reported their complaints to the pump operators besides other reporting channels.

Overall, 63% of villages in the state levy charge for water service delivery to households whereas 53% HHs reported paying water service delivery charges at the households.

95% 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, 8% 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 13% on surface water sources.

Age-wise functionality of the schemes indicates deterioration in 'always functional' schemes and a decrease in the 'non-functional scheme' in the state since 2012. 1-% point deterioration in a fully functional scheme was recorded from 2012 to 2013-18. In 2019 and later the opposite trend was maintained, however, 95% of schemes have been reported to be always functional and 0% as partially functional (i.e., a total of 95% of schemes).

Impact of JJM

Across the state, less than 0.5% HHs reported having an incidence(s) of water-borne diseases in the last year.

Since having a functional HH tap connection, 20% HHs across the state have reported that there has been a change in the no. of employment days of the adult HH members while 56% HHs reported no change.

Out of the HHs reported (i.e., 10822) that female members used to fetch water before HH tap connection, 78% reported that post-installation of HH tap connection helped reduce of time and effort in collection of water.

Across the state, 60% HHs reported that since having a functional HH tap connection the attendance of the girls going to schools has increased. This 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 90% of the households were found to have fully functional tap connections. Out of which 96% received an adequate quantity of water, more than 9 out of 10 reported receiving a fully regular supply of water and 98% received potable water.

Since having a functional HH tap connection, 26% 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, 87% reported that post-installation of HH tap connection helped reduce time and effort in collecting water. Across the Har Ghar Jal district, 16% 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, 97% of households received water on the day of the survey. While 67% of the households were found to have fully functional tap connections. Out of which 76% received an adequate quantity of water, more than 8 out of 10 reported receiving a fully regular supply of water and 98% received potable water.

Since having a functional HH tap connection, 19% 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, 82% reported that post-installation of HH tap connection helped reduce time and effort in collecting water. Across the aspirational district, 13% HHs reported that since having a functional HH tap connection their income has directly benefitted.

Functionality Status of JE-AES Districts

At the state level for JE-AES districts, 100% of households received water on the day of the survey. While 97% of the households were found to have fully functional tap connections. Out of which 99% received an adequate quantity of water, about 9 out of 10 reported receiving a fully regular supply of water and 100% received potable water.

Since having a functional HH tap connection, 17% 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, 85% reported that post-installation of HH tap connection helped reduce time and effort in collecting water. Across the JE-AES district, 13% 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	Tamil Nadu
Working tap connections- HHs which received water through tap connection at least once in last 7 days (%)	86	100
Quantity ¹ of water received by households		
Adequate quantity (>55 LPCD) (%)	85	94
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	5	3
Inadequate quantity (<40 LPCD) (%)	10	3
Regularity ² of water received by households		
Fully Regular Supply (as per schedule) (%)	80	93
Partially Regular Supply (not as per schedule) (%)	14	5
Irregular Supply (less than 9 months' supply) (%)	6	2
Potable ³ (Quality) water received by households (%)	87	97
Overall functionality ⁴ (%)	62	86

Service delivery parameters	India	Tamil Nadu
Overall user satisfaction on regularity at the household level (%)	83	95
Overall user satisfaction on overall quality at the household level (%)	82	91
Households receiving water supply daily-7 days a week (%)	74	74
Daily HH requirement of water being met by FHTC (%)	80	95
Households paying water service delivery charges (%)	35	53
Households aware of grievance redressal mechanism (%)	71	93
Households reported a reduction in time and effort in collecting water (%)	79	78
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	52
Residual Chlorine (RCL) detected within permissible limits (%)	24	32
Villages with Field Test Kits (%)	30	73
Villages in which bacteriological test was done in last 1 year by VWSC/ Pani Samiti (%)	29	31
Villages reported to have a mechanism for chlorination (%)	21	72

Institutional arrangement	India	Tamil Nadu
Village reported having presence of VWSC/ Pani Samiti (%)	38	41
Villages in which VWSC/ Pani Samiti is responsible for Operation & Maintenance of PWS schemes (%)	14	13
Villages in which persons are trained to use Field Test Kits (%)	31	62
Villages levying water service delivery to households (%)	34	63
Villages having skilled manpower for Operation & Maintenance of PWS schemes (%)	31	48
Community monitoring of water wastage in villages (%)	19	32
Villages in which signages about JJM were observed (%)	15	11

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	Tamil Nadu
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	96
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	4	2
Inadequate quantity (<40 LPCD) (%)	8	2
Regularity of water received by households		
Fully Regular Supply (as per schedule) (%)	84	95
Partially Regular Supply (not as per schedule) (%)	11	1
Irregular Supply (less than 9 months' supply) (%)	5	4
Potable (Quality) water received by households	90	98
Overall functionality (%)	69	90

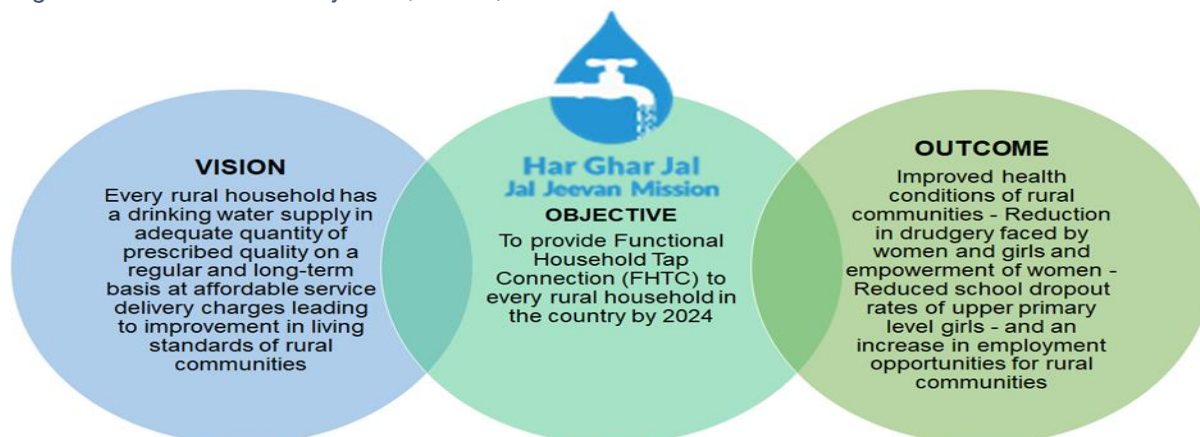
Functionality status of tap connection at households in Aspirational Districts	India	Tamil Nadu
Working tap connections- HHs which received water through tap connection at least once in last 7 days (%)	78	97
Quantity of water received by households		
Adequate quantity (>55 LPCD) (%)	85	76
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	5	9
Inadequate quantity (<40 LPCD) (%)	10	15
Regularity of water received by households		
Fully Regular Supply (as per schedule) (%)	77	84
Partially Regular Supply (not as per schedule) (%)	14	11
Irregular Supply (less than 9 months' supply) (%)	9	5
Potable (Quality) water received by households (%)	88	98
Overall functionality (%)	62	67

Functionality status of tap connection at households in JE-AES Districts	India	Tamil Nadu
Working tap connections- HHs which received water through tap connection at least once in last 7 days (%)	79	100
Quantity of water received by households		
Adequate quantity (>55 LPCD) (%)	95	99
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	2	1
Inadequate quantity (<40 LPCD) (%)	3	0
Regularity of water received by households		
Fully Regular Supply (as per schedule) (%)	80	98
Partially Regular Supply (not as per schedule) (%)	13	1
Irregular Supply (less than 9 months' supply) (%)	7	1
Potable (Quality) water received by households (%)	89	100
Overall functionality (%)	69	97

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: Tamil Nadu

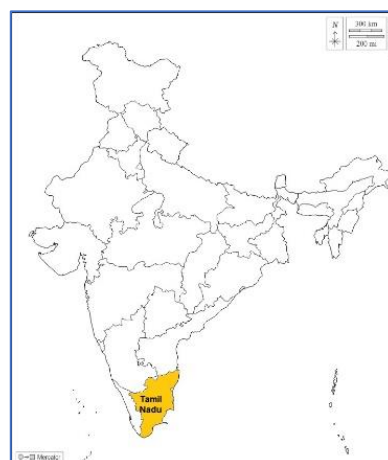
The state of Tamil Nadu lies on the southern part of India and has a population of 7,21,47,030 people. It has 36 districts and 12525 villages where 11844 villages have PWS schemes. The state lies on the East Coast Plains and Hills Region, West Coast Plains and Hills Region, Southern Plateau and Hills Region and receives an average annual rainfall of about 1851.4mm. Among the villages with PWS schemes, 10015 villages (79.96%) have more than 20 households with functional tap connections. The state 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:

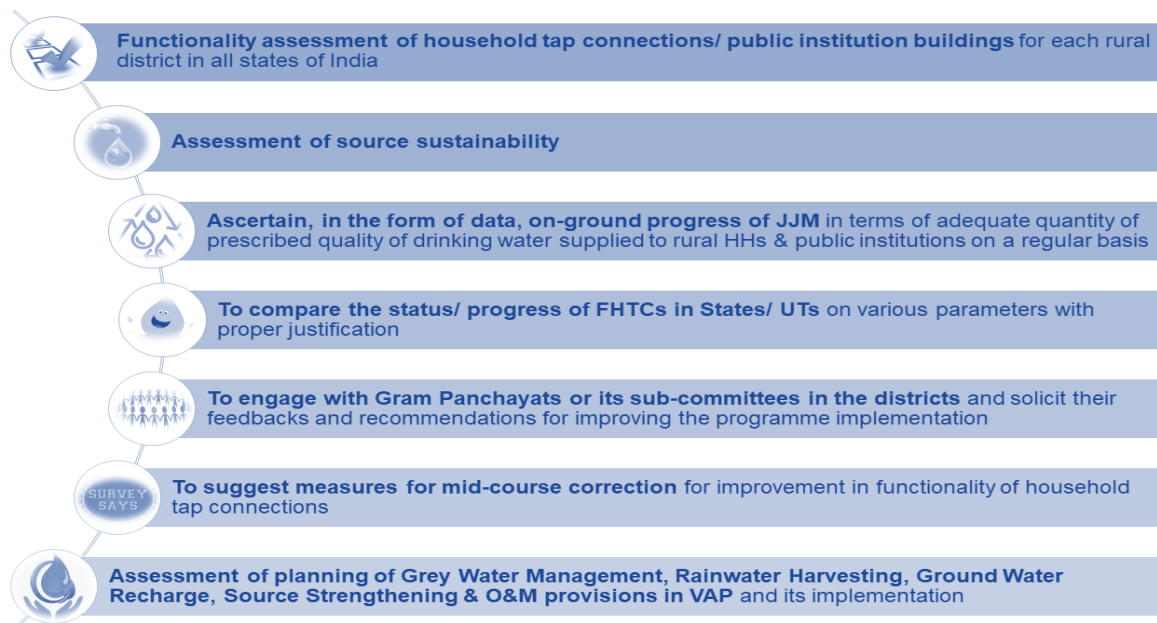
- Not a Har Ghar Jal state.
- 3 districts are Iron & 10 districts are Fluoride affected
- 10015 (79.96% of all) villages with PWS more than 20 FHTC
- 7.68% villages covered under HH tap connections under HGJ



2.2. FHTC Assessment Objectives

The overall objectives of the FHTC assessment are as presented:

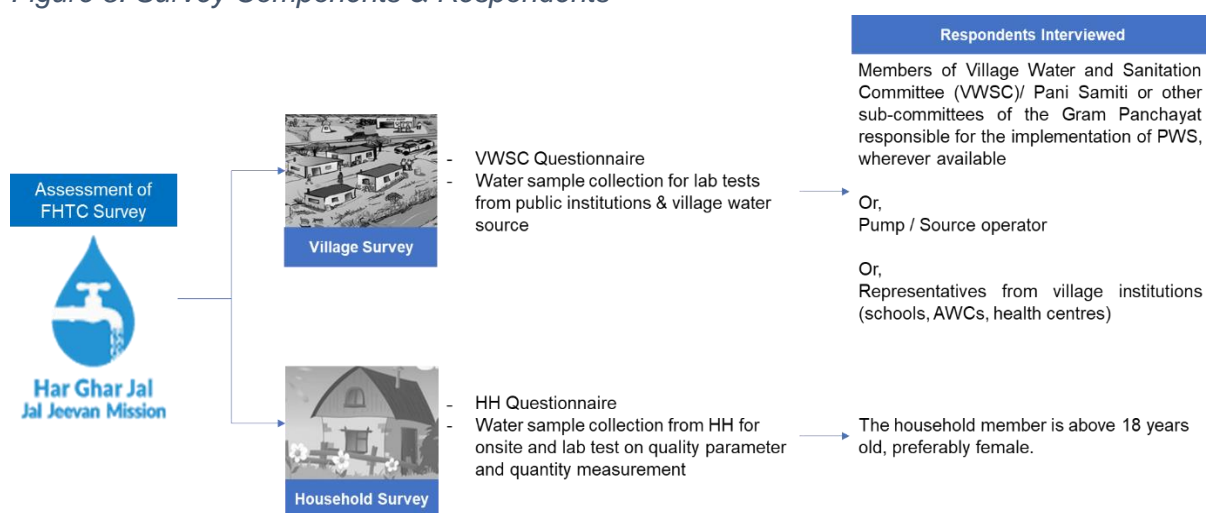
Figure 4: FHTC Assessment Objectives



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

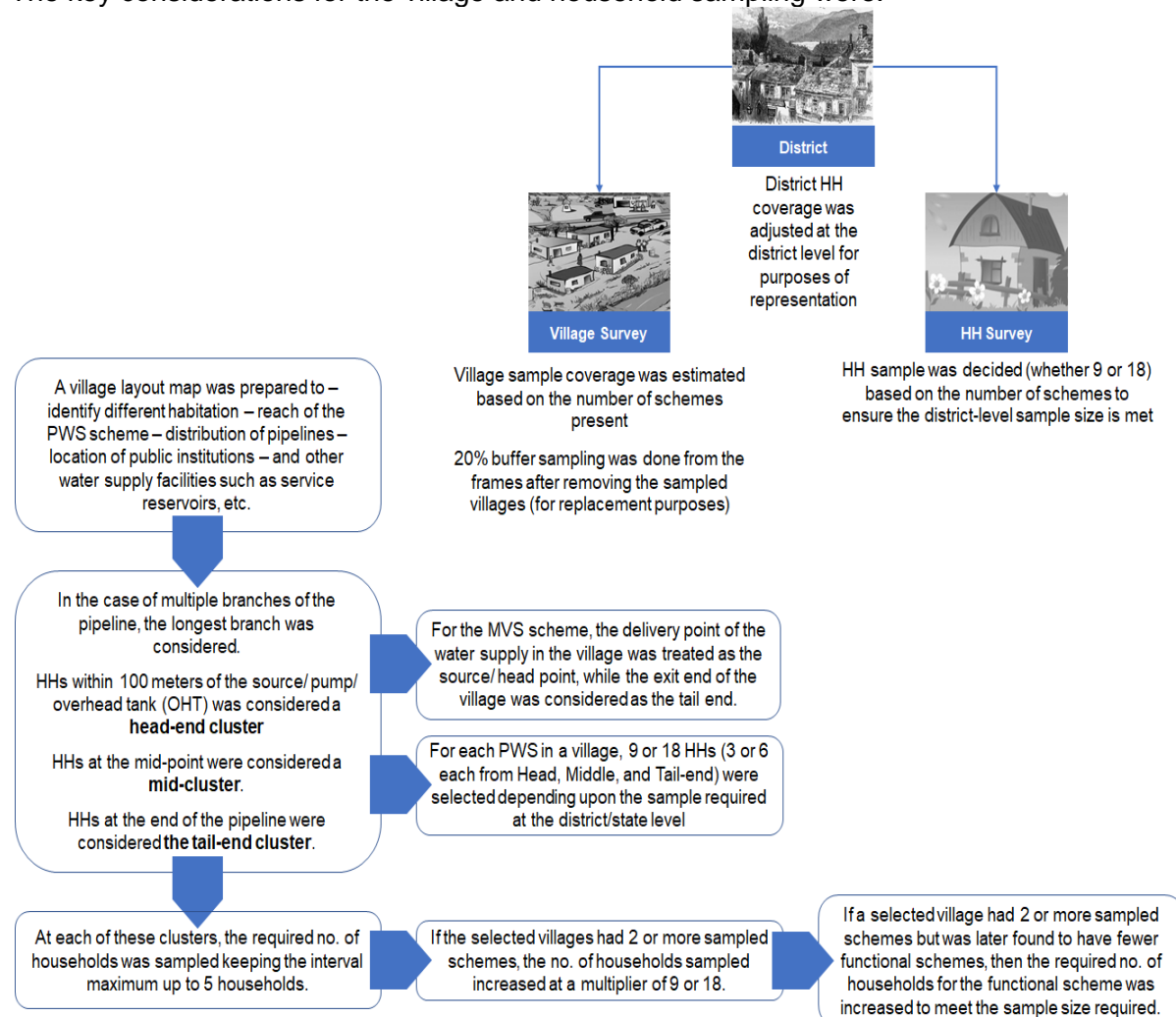
As per the design, all villages having a PWS scheme with 20 or more functional household tap connections were included in the sample frame. The probability proportionate to size (PPS) method was used for village selection in each district. The steps for random selection of villages using PPS are presented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

Figure 6: Steps for Random Sampling of Villages



Figure 7: Household Selection

The key considerations for the village and household sampling were:

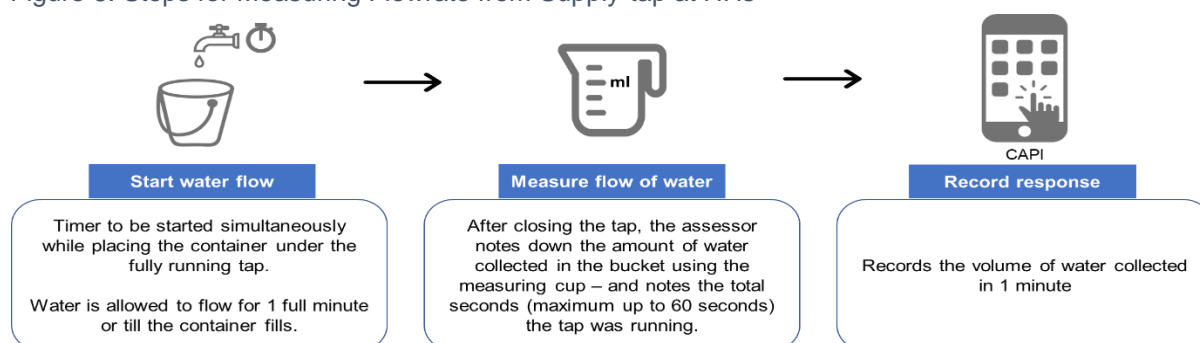


The record of all district-wise village replacements is maintained and reported as part of the annexure.

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:

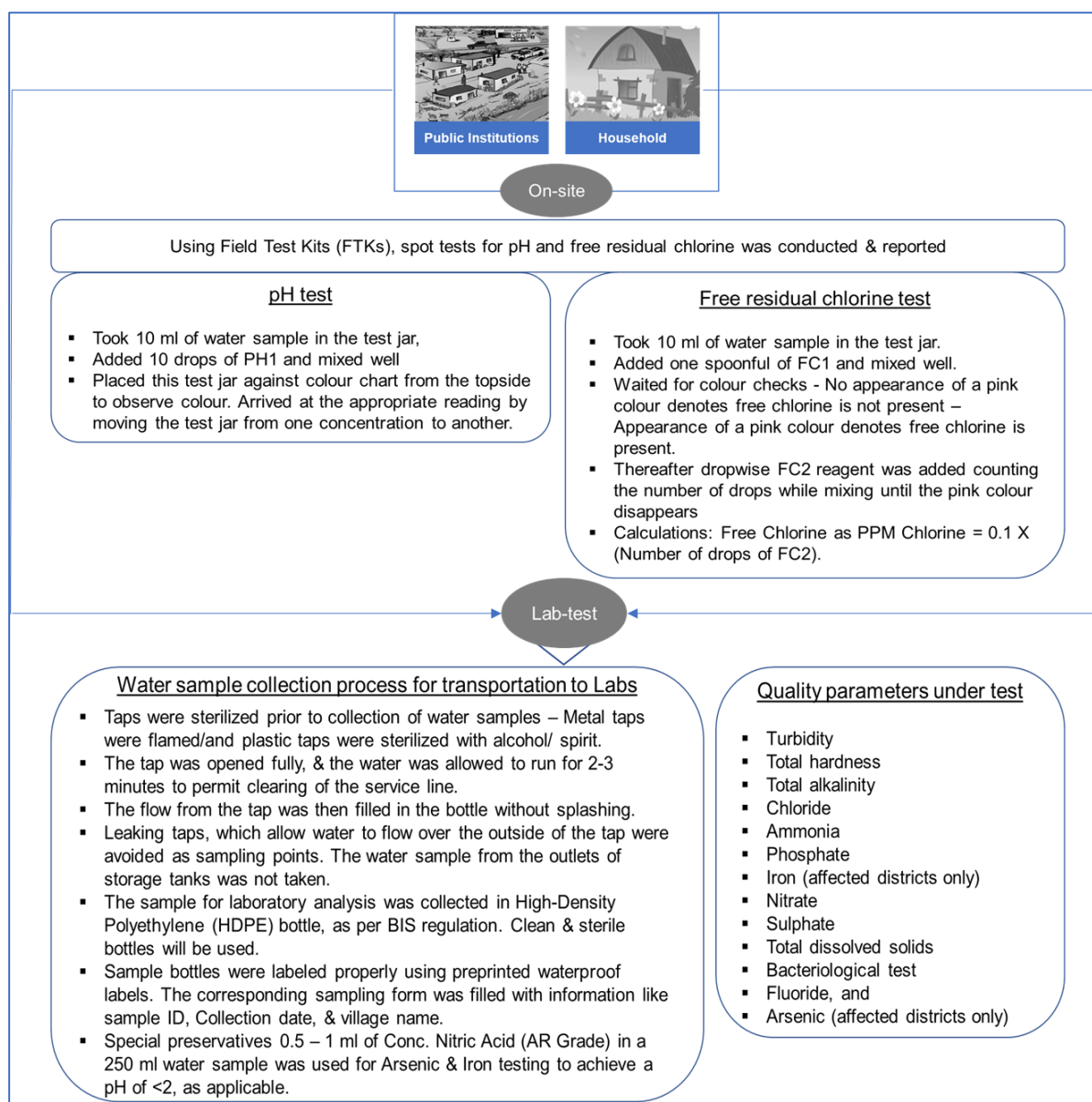
- Assessor first asked and recorded length, breadth, and height.
- Assessor dipped a 5 feet long rod, marked the level of the water table, and calculated the volume – length x breadth x-height of water.
- Next the assessor opened the valve of the connection and allowed the water to flow inside the storage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

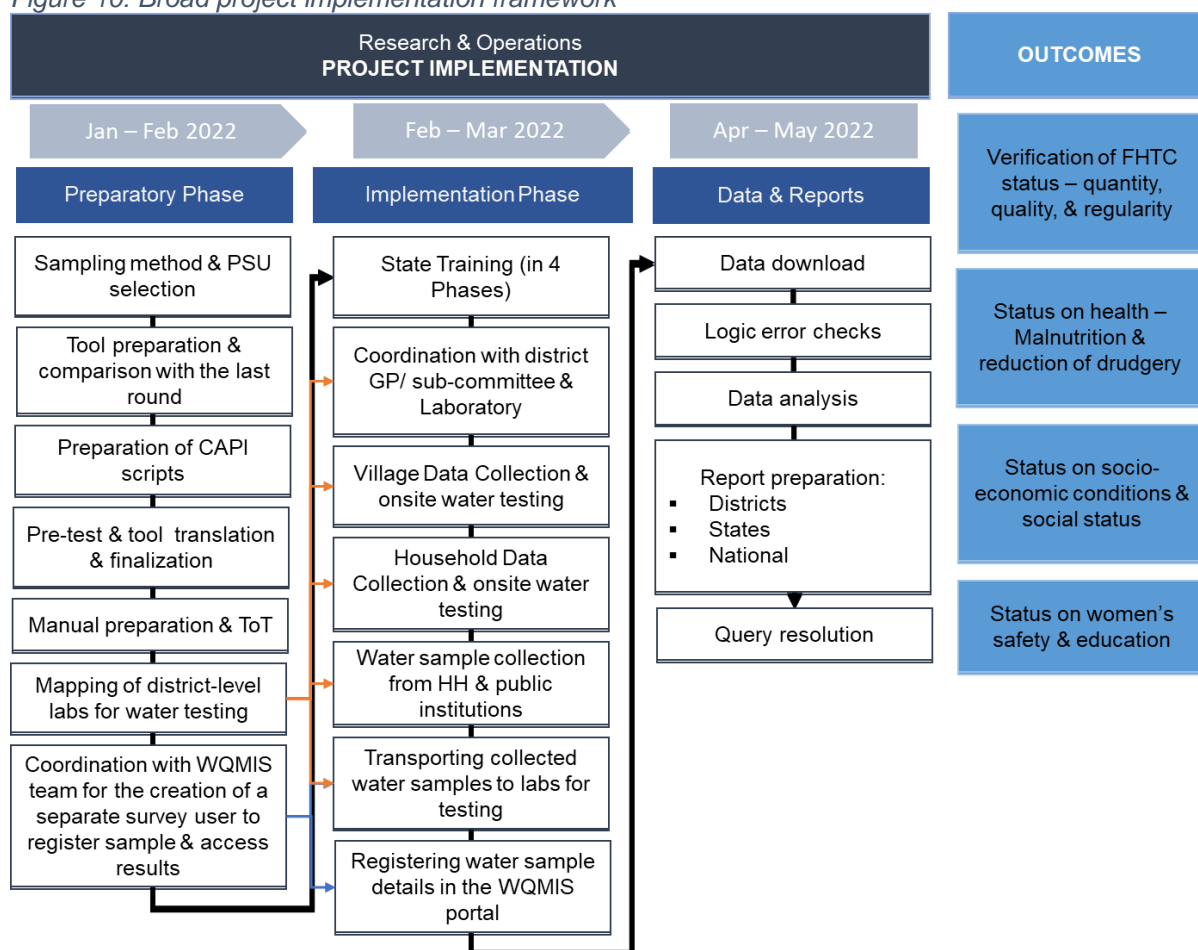


JJM, with the support of the BMI Division of ICMR, enabled a new interface on the WQMIS portal for “Functionality Assessment (FA) User” to enable seamless harmonization of water sample registration, and sample submission for testing, and sharing of results as per the applicable quality parameters.

2.8. Project Implementation

An overview of the project implementation is as presented:

Figure 10: Broad project implementation framework



A total of 8 teams (comprising 8 supervisors, 48 assessors, and 8 water collection assistants) were recruited, trained, and deployed to complete the survey across the states of Tamil Nadu. 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
Tamil Nadu	8 Teams	09 th March	7 th April	30 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							
State	Targeted sample			Achieved sample			
	District	Village	HH	District	Village	HHs	PIs
India	712	13,300	3,00,000	712	13,299	3,01,389	16,148
Tamil Nadu	36	413	13,887	36	415	13,922	987

2.10. Sampled village and household profile

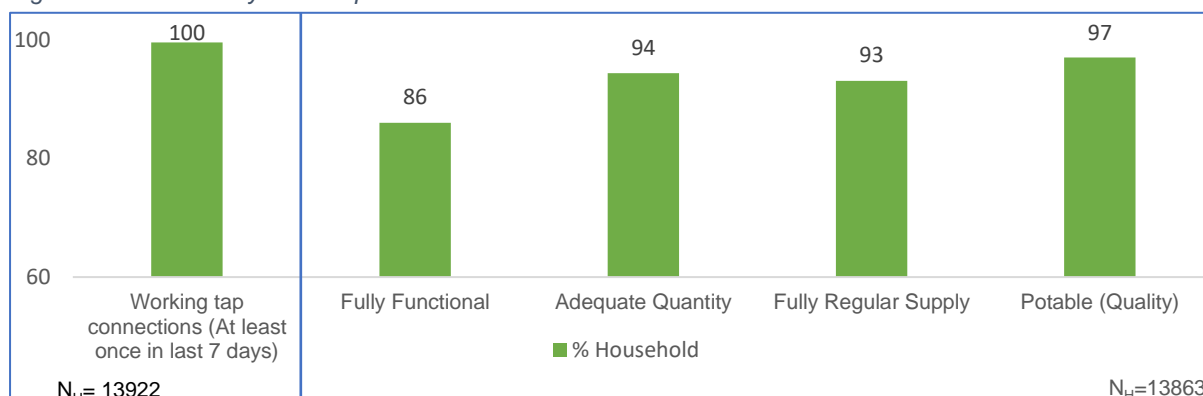
SAMPLED VILLAGES	SAMPLED HOUSEHOLDS
<ul style="list-style-type: none"> Total no. of villages covered in the state – 459 Percentage of SC dominated villages covered in the State is 48.7% (while at national level the average is 12.6%) Percentage of ST dominated villages covered in the State is 0.0% (while at national level the average is 20.2%) Higher proportion of pump operators interviewed at the village level 2.0% of the villages reported to have any historical incidence of water contamination 	<ul style="list-style-type: none"> Total no. of households covered in the state – 9549 (Respondents: Male 2068, Female 7481) Proportion of General – 34.9%, SC 49.8%, ST 1.8%, OBC 13.5% households 78.3% of the FHTC connections are under the name of a female member Average household size – 5.4 100% positive user experience in 5/5 measures

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_H=13863 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=13863) had working tap connections. Moreover, more than 9 out of 10 households (94 percent) received adequate (≥ 55 LPCD) water supply and more than 9 out of 10 received regular supply (93 percent) of water. The on-site testing and lab test results of the water indicates that more than 9 out of 10 (97%) of the sampled households in the state receive potable water.

Out of the 13922 HHs sampled for the FHTC assessment, water quantity and quality test was carried out in 13863 due to non-availability of water in few HHs on the day of survey.

S. No.	District	Working tap connections for 7 days preceding the survey (%HH)	Quantity ≥ 55 LPCD (% HH)	Regularity (% HH)	Potability# (% HH)
1.	Coimbatore	100	100	98	100
2.	Tiruppur	100	81	83	100
3.	Cuddalore	100	99	99	72
4.	Krishnagiri	100	88	92	100
5.	Dharmapuri	100	80	98	99
6.	Dindigul	100	81	72	98
7.	Erode	100	100	100	100
8.	Kanchipuram	100	99	94	99
9.	Chengalpattu	100	99	93	95
10.	Kanniyakumari	100	92	94	93
11.	Karur	100	100	100	100
12.	Madurai	100	96	96	99
13.	Nagapattinam	100	100	100	100
14.	Namakkal	100	100	99	100
15.	Perambalur	100	90	99	97
16.	Ariyalur	100	100	100	97
17.	Pudukkottai	100	96	95	92
18.	Salem	100	99	42	99

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)
19.	Sivaganga	100	99	96	78
20.	Thanjavur	100	99	99	99
21.	Theni	100	85	75	100
22.	Tiruvallur	100	100	100	95
23.	Tiruvarur	100	100	100	100
24.	Tiruchirappalli	100	94	97	100
25.	Tirunelveli	100	100	96	97
26.	Tiruvannamalai	100	97	92	100
27.	Thoothukudi	100	99	99	100
28.	Ranipet	100	98	99	100
29.	Vellore	100	93	99	100
30.	Tirupathur	100	90	99	93
31.	Villupuram	100	100	96	100
32.	Kallakurichi	100	98	99	99
33.	Virudhunagar	100	74	82	98
34.	TAMIL NADU	100	94	93	97
35.	Tenkasi	99	96	81	97
36.	Ramanathapuram	94	77	87	97
37.	Nilgiris	91	97	99	100
# 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		

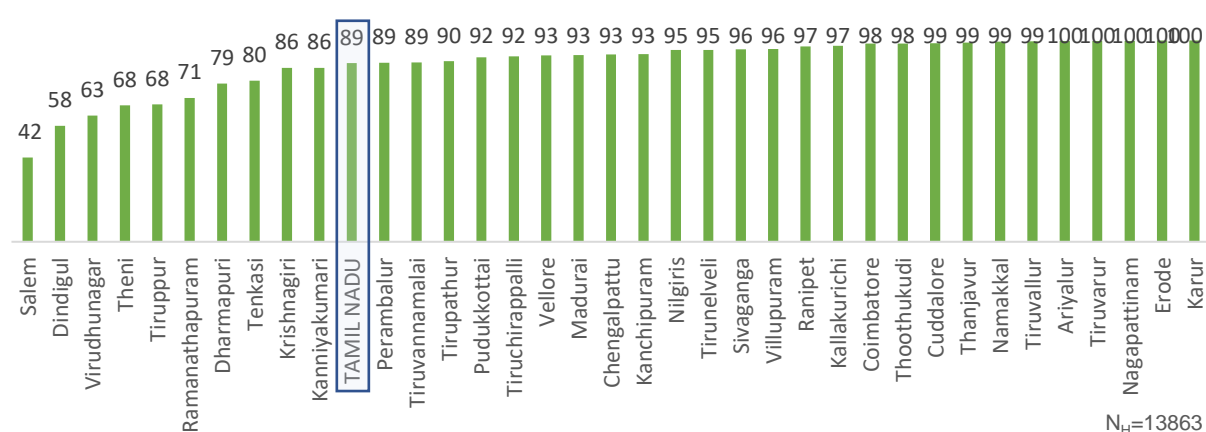
District level comparison across the districts indicate that Nilgiris and Ramanathapuram reported functionality less than 95 percent. The districts of Ariyalur, Namakkal, Tiruvarur, Tiruvallur, Villupuram, Nagapattinam, Erode, Coimbatore, Tirunelveli and Karur FHTC provide more than 55 LPCD of water in more than 99 percent HHs.

More than 99 percent HHs in the districts of Ariyalur, Tiruvarur, Tiruvallur, Nagapattinam, Erode and Karur reported to regularly receive water through FHTC. Regular supply of water is less than 50 percent in the district of Salem.

Potability of water was found to be less than 75% in the district of Cuddalore.

B. District wise functionality status

Figure 12: District wise Functionality of HH tap connection



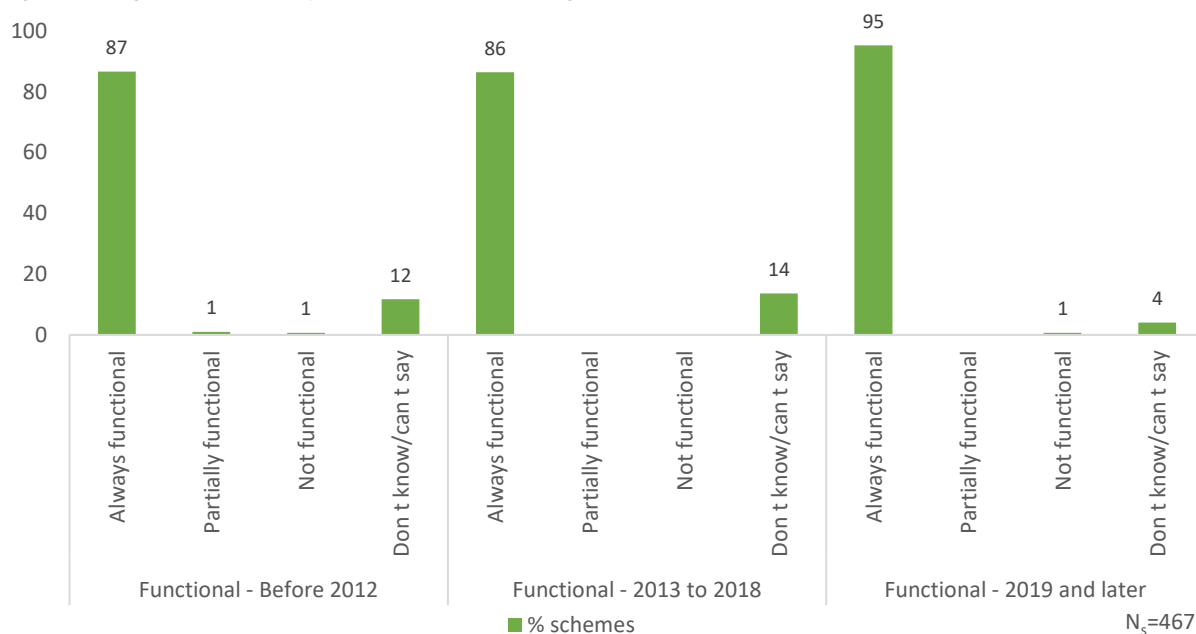
N_H=13863

'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., 13,863 HHs.

89 percent HHs in the state were found to have functional HH tap water connection. Ariyalur, Tiruvarur, Erode and Karur district reported 100 percent functional households in the state, followed by Tiruvaruru Nagaattinam, and Namakkal with 99 percent functionality. In the districts of Kallakurichi and Salem, 1 out of 2 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



N_S=467

More than 9 out of 10 schemes are functional since 2019 which reflects a 8-point increase since 2012 and 9 point increase from 2013 to 2018 period.

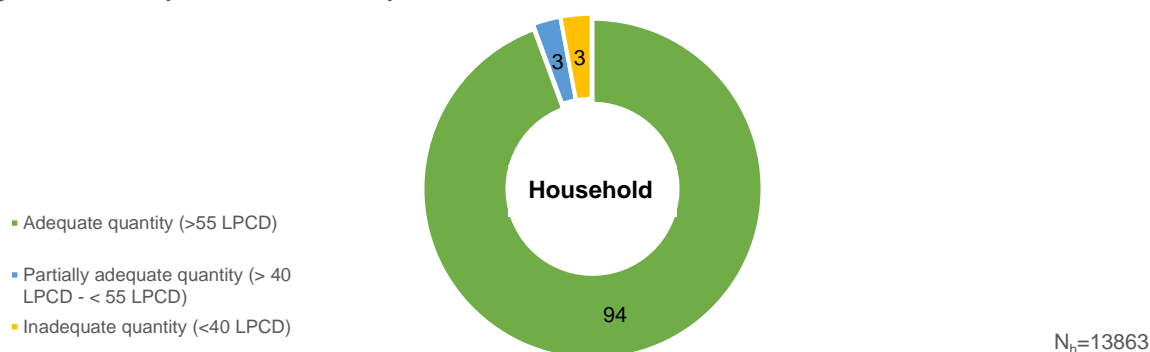
3.2. Quantity, Regularity, and Quality of Water

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)

94% HHs reported receiving adequate quantity of water (more than 55 LPCD of water).

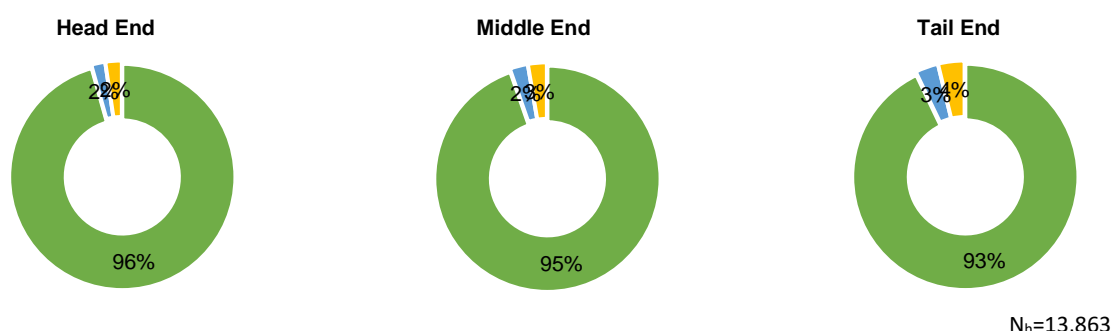
Figure 14: Quantity of water received by households



Water quantity in the households has been calculated in 13863 due to non-availability of water in few HHs on the day of survey.

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

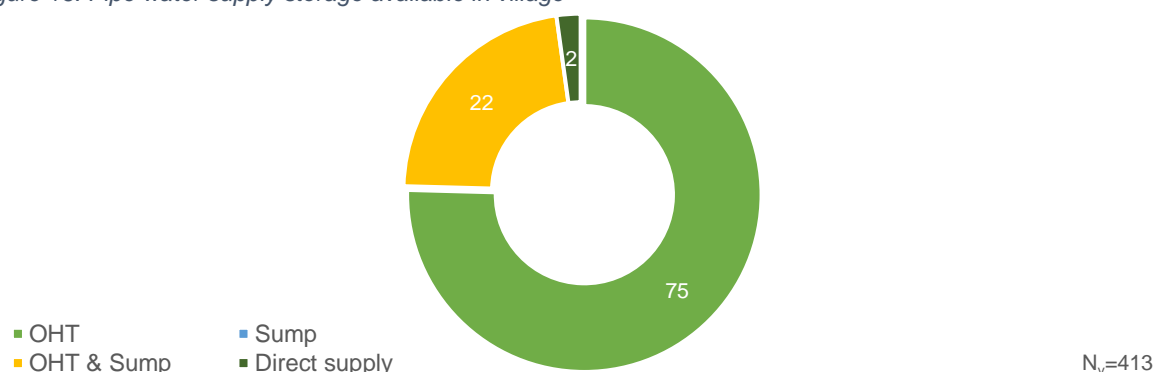
Figure 15: Quantity of water received across head, middle and tail end households



The quantity of water received across the head, middle, and the tail end was observed to be uniform, and more than 90 percent (94%) of the sampled households received water in adequate quantity, i.e., greater than or equal to 55 LPCD.

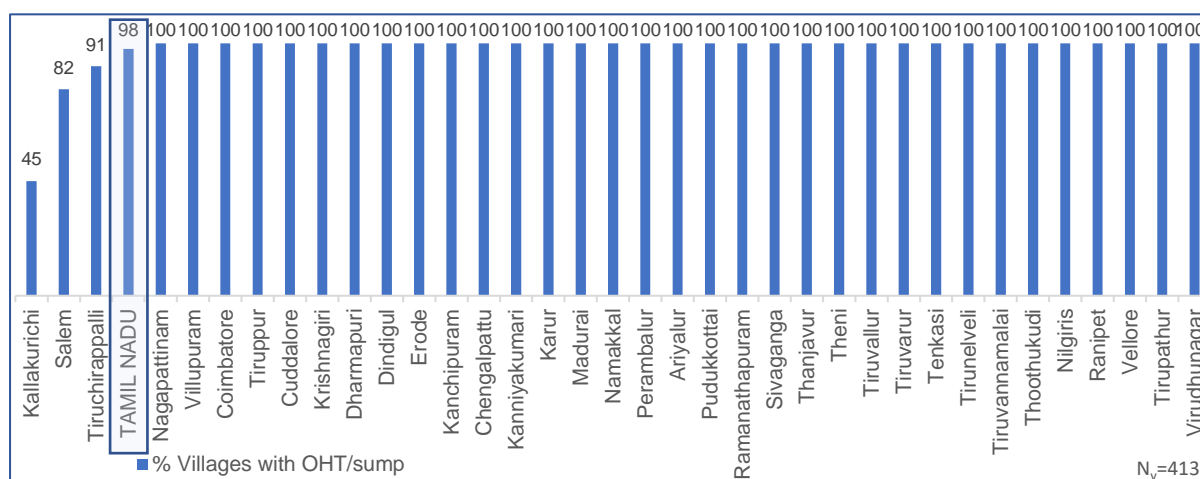
Types of water storage arrangements (in %)

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 75 percent reported water being stored in overhead tanks.

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

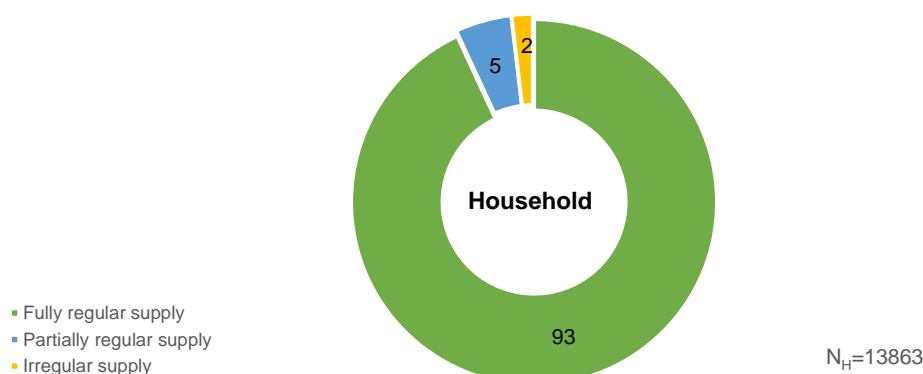


98 percent villages in the state have either an OHT or a sump for storing water for supplying to the households. Kallakurichi, Salem, and Tiruchirappalli are the only districts where the villages are below the average state level to have either an OHT or a sump. All other districts have all villages have facilities to store water for supplying to the households.

B. Regularity of water supply to villages and households

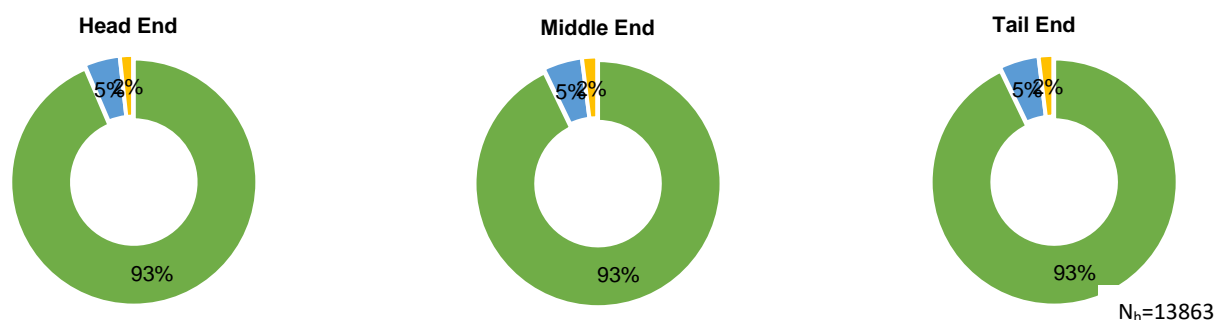
93% HHs receive a regular supply of water (as per agreed schedule).

Figure 18: Regularity of water received by households



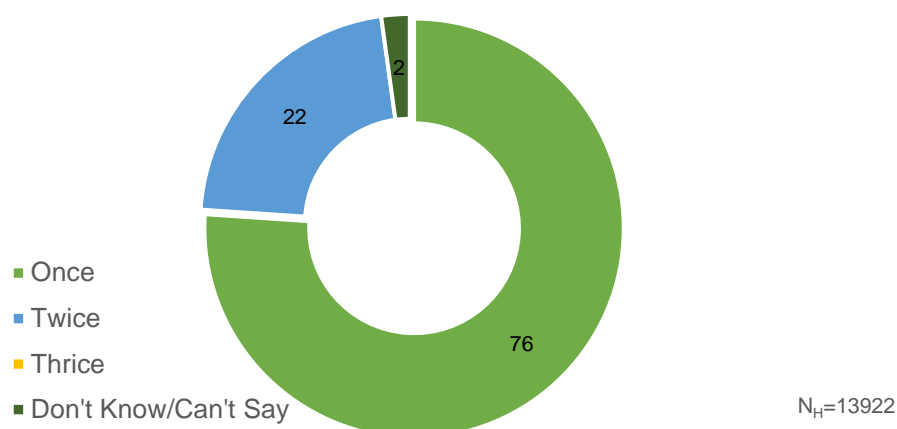
Regularity of water received across head, mid, and tail end

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.

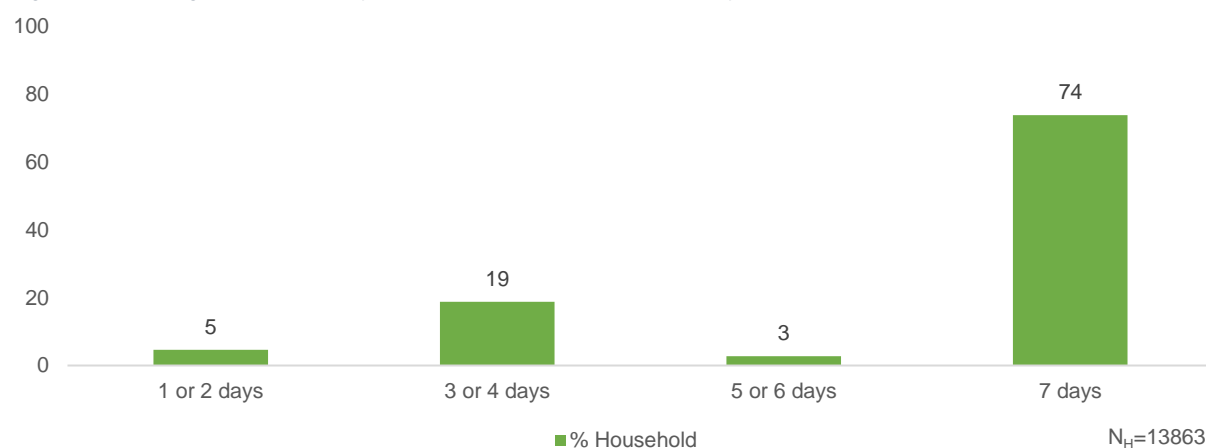
Figure 20: Average no. of times water is supplied in a day



HHs in **76% of districts** receive water once in a day. The average duration of water supply across the state was reported to be **2 hours per day**.

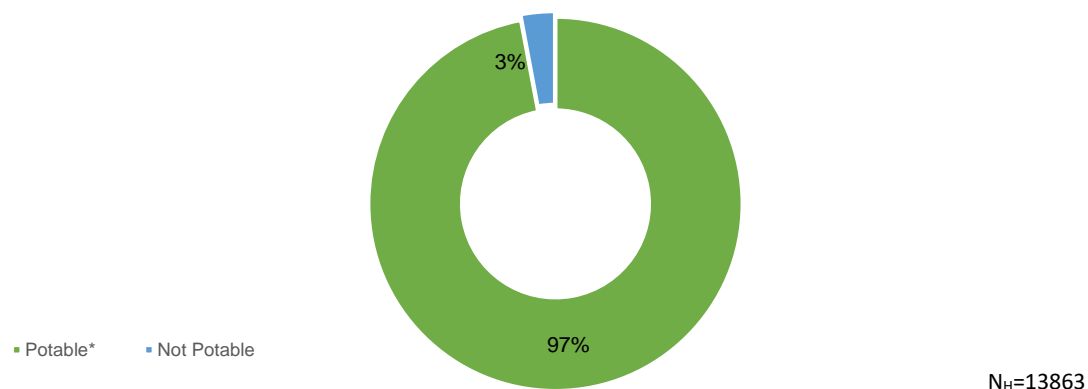
Average water supply days in a week to households

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



C. Potability Water – Quality

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 Tamil Nadu 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 =413)	Water Samples Tested from Public Institutes			
	Anganwadi Centre	Health Facility	Schools	Others
pH (on-site)				
Turbidity	99	100	100	99
Total Hardness	98	100	99	99
Total Alkalinity	99	100	99	100
Chloride	100	100	100	100
Ammonia	Not Tested			
Iron	100	100	100	100
Nitrate	99	98	100	98
Sulphate	99	100	100	100
Total Dissolved Solids	99	100	99	99
Bacteriological Test (Absence)	97	100	100	95
Fluoride	100	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=13863). 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)	13863	98
Turbidity	7408	100
Total Hardness	7528	98
Total Alkalinity	7524	99
Chloride	7593	100
Ammonia	8	100
Iron	513	100
Nitrate	7576	100
Sulphate	7421	100
Total Dissolved Solids	7598	100
Bacteriological Test (Absence)	1901	99
Fluoride	2466	100
Arsenic	No History	

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

The Residual Chlorine (RC) in the state of Tamil Nadu was found in 32% samples. Also, 9% samples were having RC outside range and 59% samples, had no RC. 99% of water samples passed the bacteriological contamination test. While in 1% samples bacteriological contamination is found, out of which 1% samples had chlorine in permissible range.

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. 14850 water samples were submitted, and 8114 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	Coimbatore	Yes	378	407	134	The labs did not have capacity to test more than 20-25 number of samples and had issues of human resource, reagents etc."
2	Tiruppur	Yes	387	423	1	The labs did not have capacity to test more than 20-25 number of samples and had issues of human resource, reagents etc."
3	Cuddalore	Yes	378	413	369	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	Krishnagiri	Yes	396	422	405	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	Dharmapuri	Yes	387	414	384	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
6	Dindigul	Yes	387	422	383	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	Erode	Yes	378	408	388	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
8	Kanchipuram	Yes	381	402	394	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	Chengalpattu	Yes, subdistrict/subdivision lab	388	409	92	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	Kanniyakumari	Yes	397	432	106	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	Karur	Yes	378	406	0	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	Madurai	Yes	387	423	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
13	Nagapattinam	Yes	424	461	273	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	Namakkal	Yes	378	399	147	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
15	Perambalur	Yes	378	409	132	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	Ariyalur	Yes	379	409	321	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	Pudukkottai	Yes	396	397	377	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	Ramanathapuram	Yes	378	393	379	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	Salem	Yes	392	407	9	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	Sivaganga	Yes	389	425	325	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc

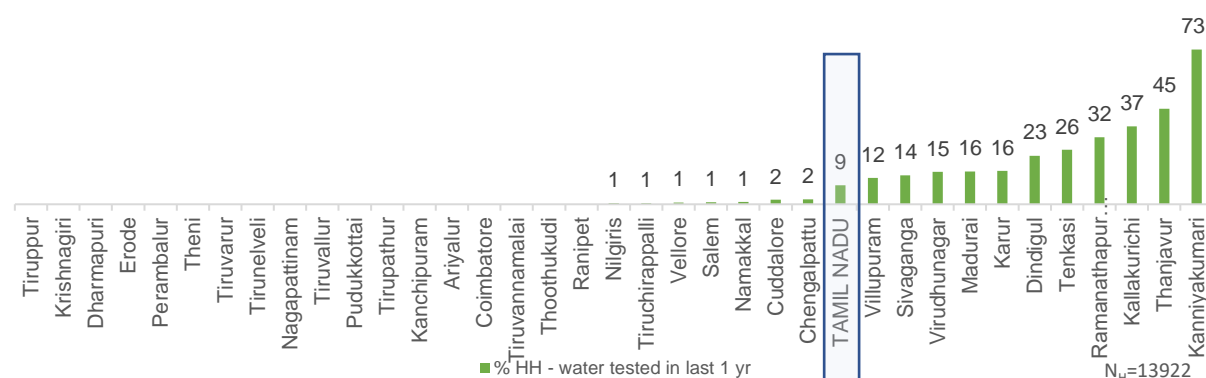
Table No. 6: Performance of Labs						
Sl. No	District	Lab available	HH surveyed	Samples submitted	Report received	Overall lab experience
21	Thanjavur	Yes	393	424	421	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
22	Theni	Yes	387	413	332	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
23	Tiruvallur	Yes	398	416	332	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	Tiruvarur	Yes	380	402	267	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	Tiruchirappalli	Yes	381	416	0	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	Tenkasi	Yes, subdistrict/subdivision lab	396	432	393	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
27	Tirunelveli	Yes	387	415	410	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	Tiruvannamalai	Yes	378	391	105	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	Thoothukudi	Yes	378	418	0	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	Nilgiris	Yes	396	387	384	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	Ranipet	Yes, subdistrict lab	378	401	86	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
32	Vellore	Yes	379	409	0	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	Tirupathur	Yes, subdistrict lab	388	409	181	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
34	Villupuram	Yes	401	420	48	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
35	Kallakurichi	Yes, subdistrict lab	388	394	0	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
36	Virudhunagar	Yes	378	422	118	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

9% 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

The **SVS prescribed** and **MVS scheme** faced the most challenges (1%) in comparison to the other schemes in the state.

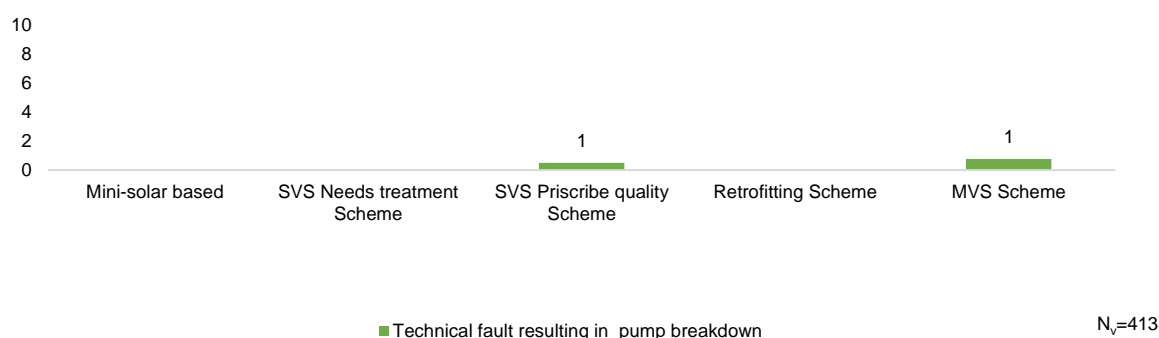
Figure 24: Schemes reported to have faced challenge in village



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.

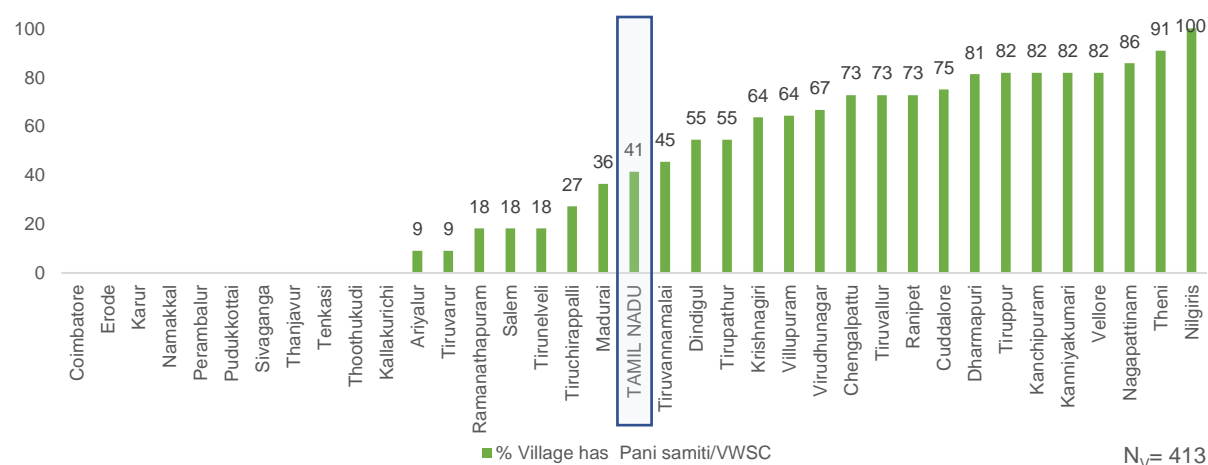
Figure 25: Type of challenge faced by the schemes



A. Presence of VWSC/Pani Samiti

41% of villages in the state reported to have a VWSC or a Pani Samiti.

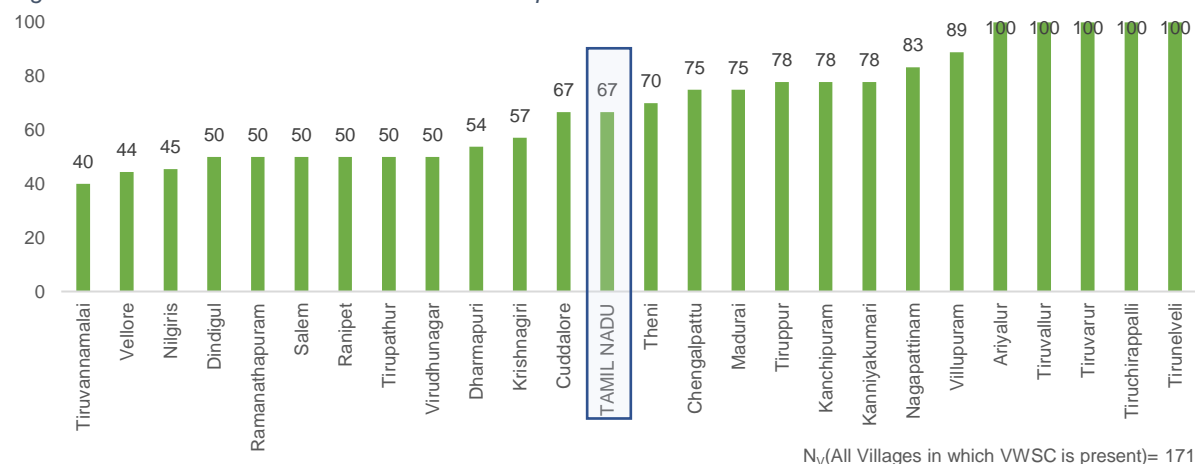
Figure 26: Villages where VWSC/ Pani Samiti is present



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

67% of the villages have more than 50% females as VWSC members.

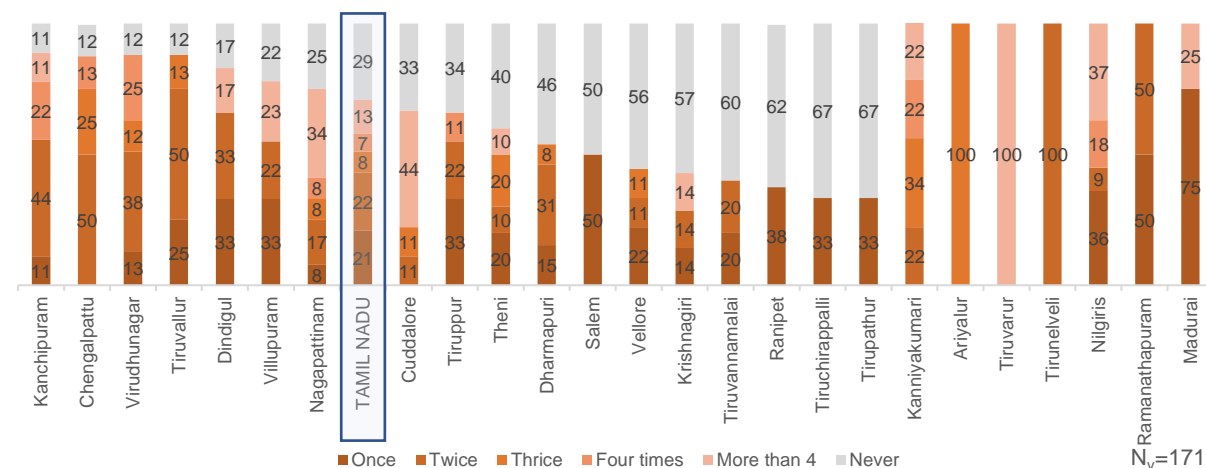
Figure 27: VWSC/ Pani Samiti with more than 50 percent female members



C. VWSC Meetings in last one year

Across the villages in the state, that reported to have VWSC/Pani Samitis (171 villages), no meetings in last one year was reported the most (29%).

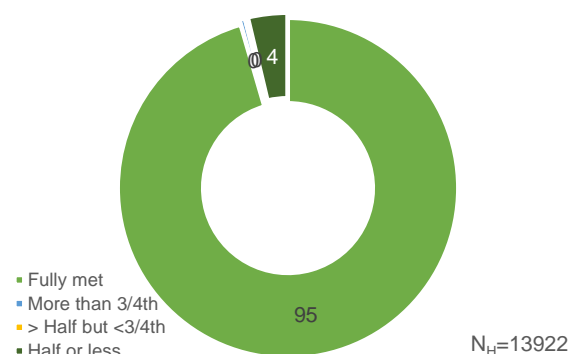
Figure 28: VWSC meetings held in last one year



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

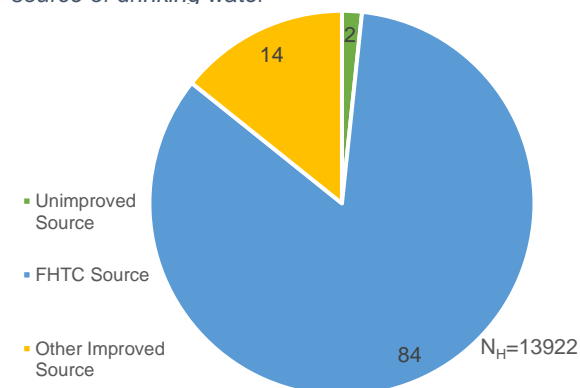
95% of HHs reported that their daily requirement of water was being met by HH tap connections

Figure 29: Daily household's requirement of water being met by FHTC



84% HHs reported HH tap connections as their primary source of drinking water.

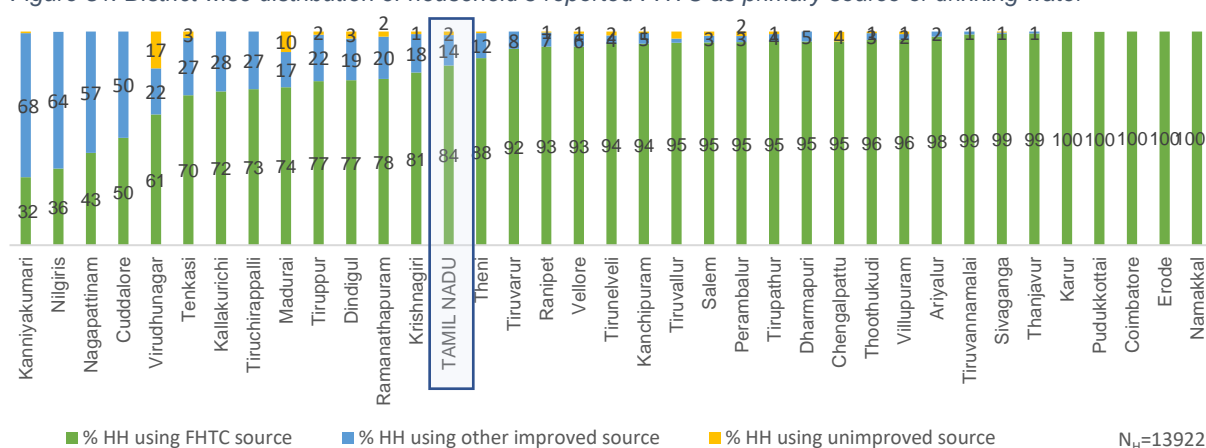
Figure 30: Households reported FHTC as primary source of drinking water



More than 9 out of 10 (95%) HHs reported their daily requirement of water being fully met by the HH tap connections. And 84 percent HHs reported used household tap connection for drinking water (primary source). About 14 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.

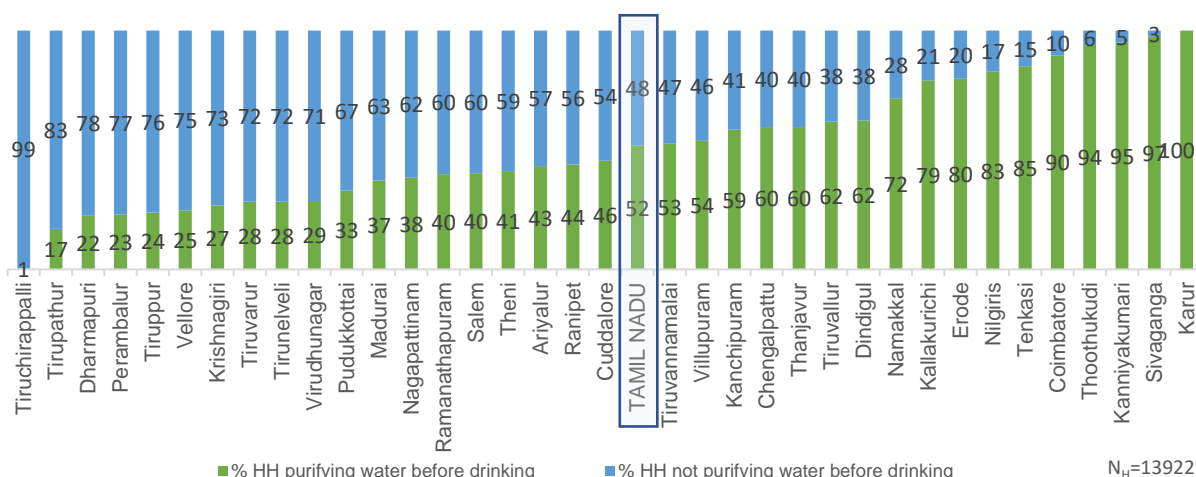
Overall, **98% of HHs** reported using improved primary source of drinking water, out of which **84% of HHs** reported HH tap water as their primary source.

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



A. Households who practice purifying of water before drinking

Figure 32: Households who practice of purifying water before drinking

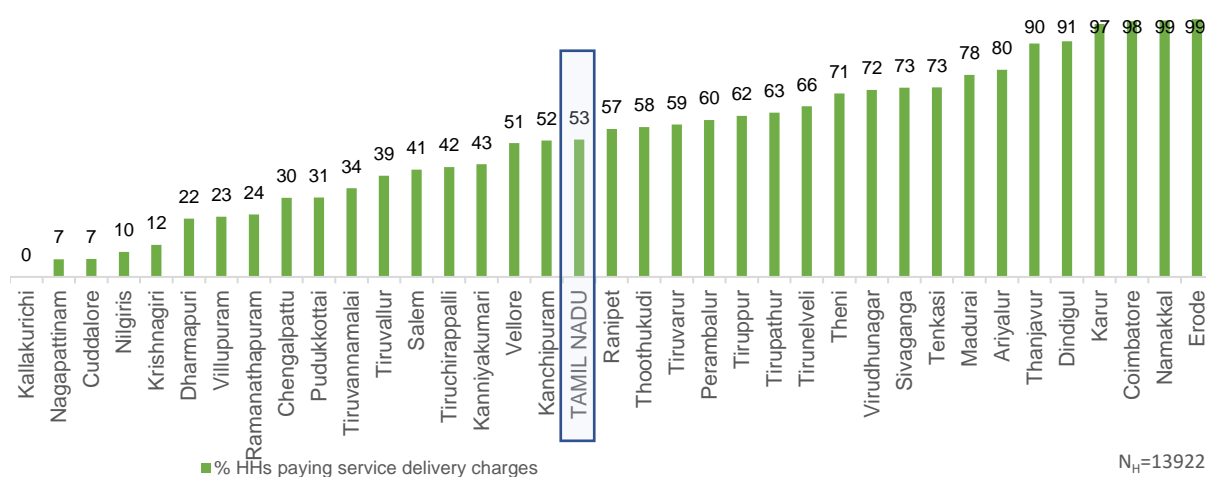


Practice of purifying water before drinking was reported the most in Karur (100%) where 100% HHs reported using HH tap water as primary drinking water source, while the least was reported in Tiruchirappalli (1%) where 73% HHs reported using HH tap water as a primary drinking water source.

B. Households paying water service delivery charges

In Tamil Nadu, around 53% of the sampled households were found to be paying service delivery charges, Erode and Namakkal being the district with the highest percentage of such households (99%) and Kallakurichi being the districts in which households reported not paying any water service delivery charges.

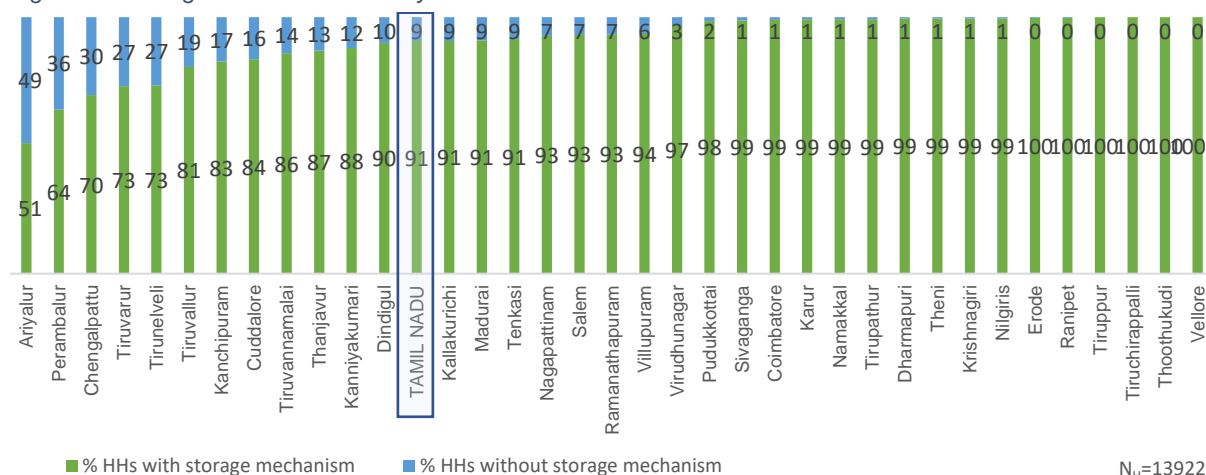
Figure 33: Households paying water service delivery charges



C. Storage mechanism used by households

Overall, 91% households in Tamil Nadu were found to use some mechanism to store water in the household.

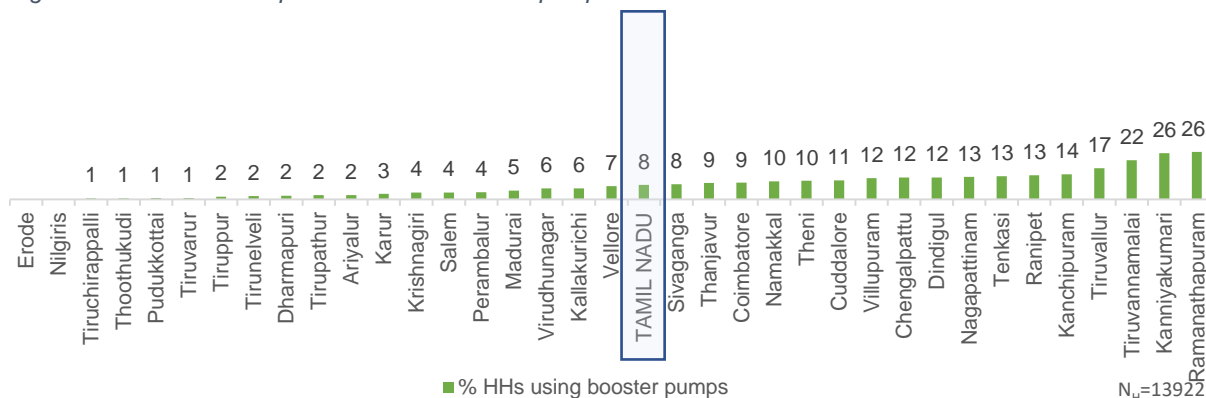
Figure 34: Storage mechanism used by households



D. Households using booster pumps

Overall, **8% HHs** reported using booster pumps to maximize the water flow through their piped water connections. Ramanathapuram and Kanyakumari reported 26% each of HHs using booster pump in the state while Tiruchirappalli, Thoothukudi, Pudukkottai and Tiruvallur reported only 1%

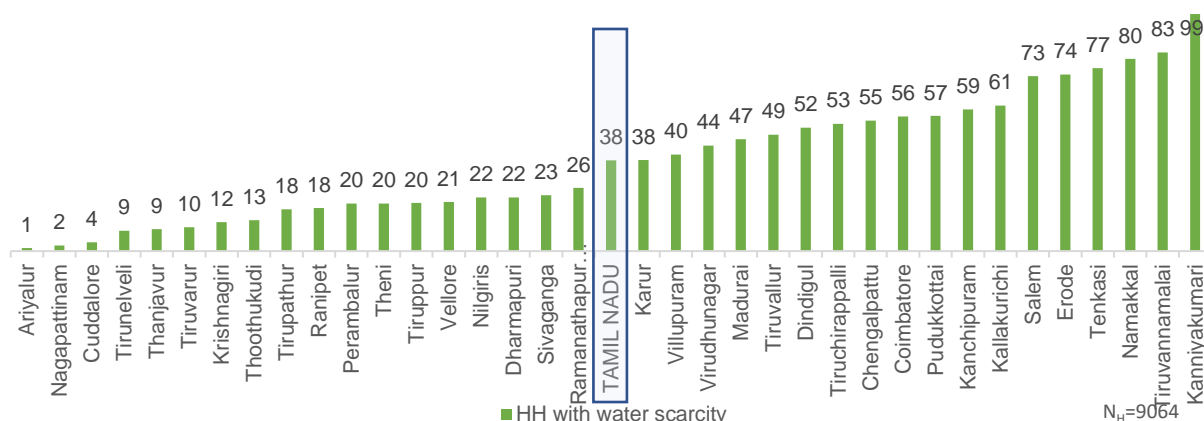
Figure 35: Households reported to use of booster pumps



E. Households who faced shortage of water

In the state, **31% HHs** faced shortage of water during any time of the year.

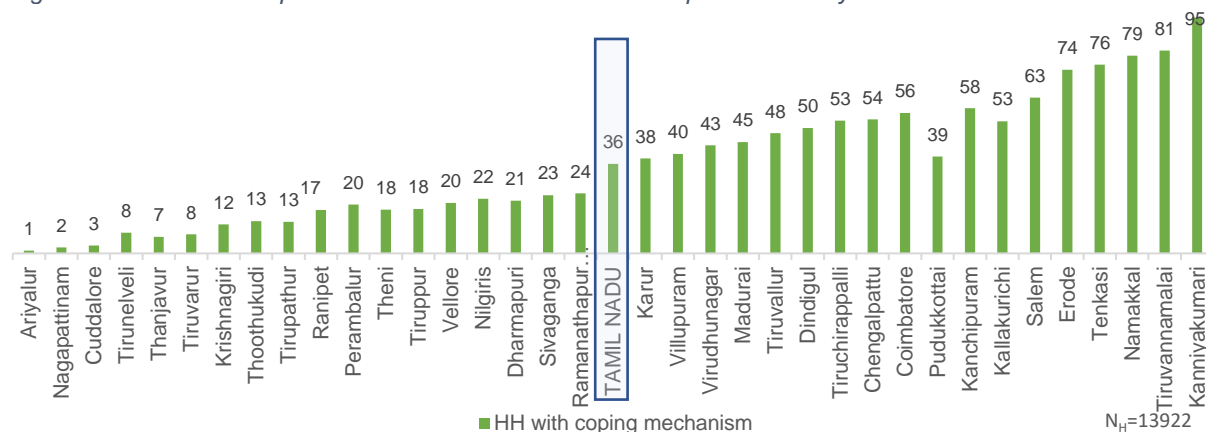
Figure 36: Households who faced water scarcity



F. Households with coping mechanism during scarcity of water

In the state, **38% HHs** faced shortage of water during any time of the year, while **24% 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

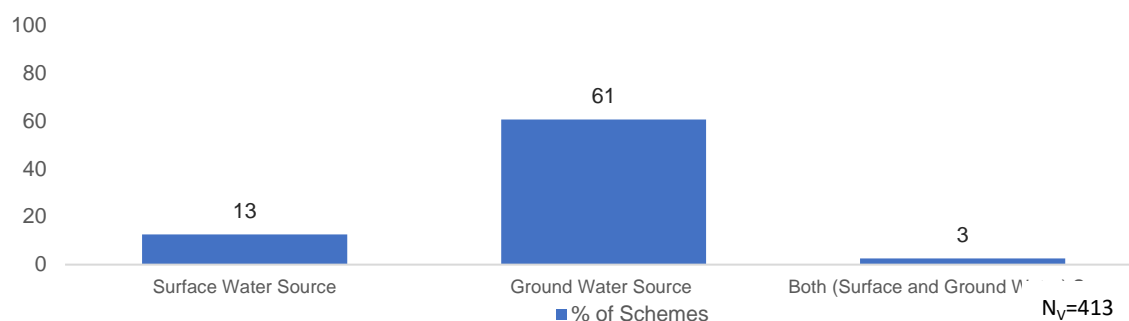


3.5. Source sustainability at the village level

Schemes based on surface and ground water

13% of schemes reported to be based on surface water source while **61% of schemes** reported to be based on ground water sources

Figure 38: Schemes based on water source in village

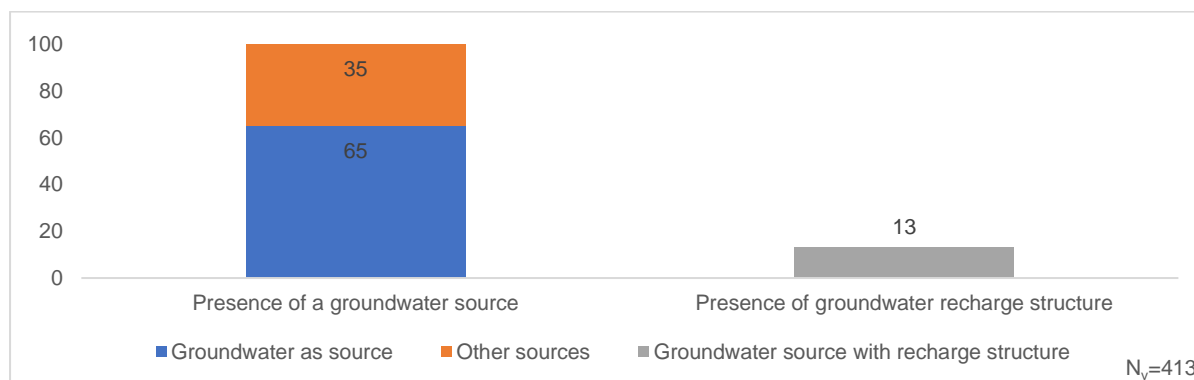


*'Surface Water Source' is Stream, Spring, Glacier, River, lake, pond etc. and Groundwater Source is open well, borewell, tube well, handpump, spring, etc.

Villages reported having presence of a groundwater source

In the state, **65% villages** reported the presence of groundwater sources like improved dug wells and borewells. Out of which, 13 percent of villages reported (i.e., 54 villages) reported having a recharge structure.

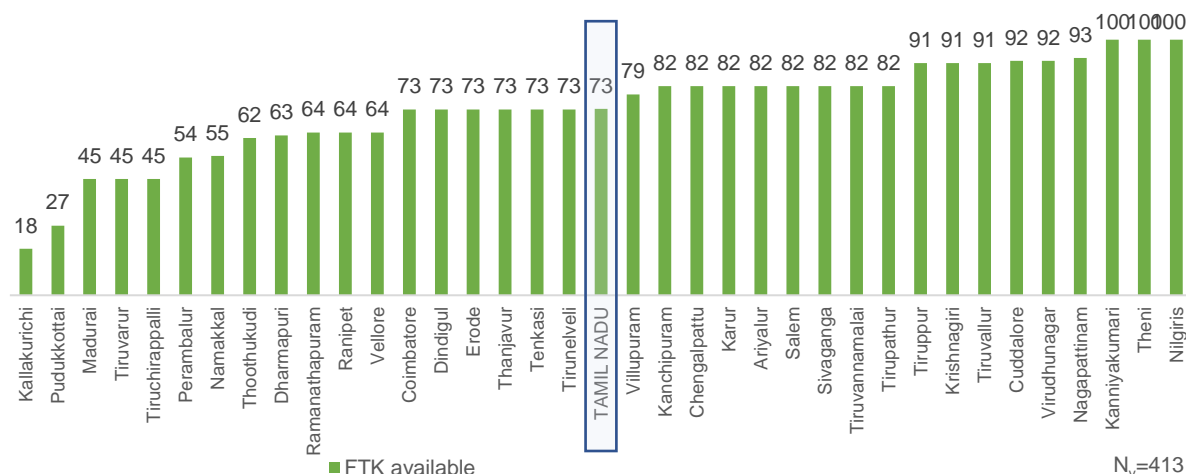
Figure 39: Villages reported the presence of groundwater sources and among those how many reported to have a recharge structure



3.6. Water quality monitoring and surveillance in the villages

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

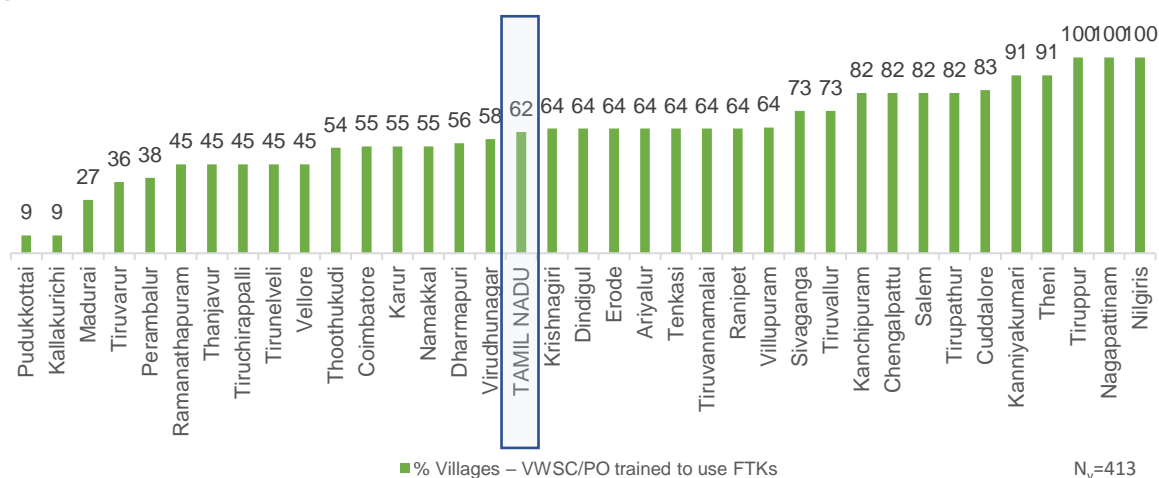
Figure 40: Availability of field test kits with VWSC/ Pani Samiti



With regards to water quality testing in the village by VWSC, 73% villages in the state reported having available field test kits. Kanyakumari, Theni and Nilgiris reported 100% villages having available field test kits for water quality testing, while Kallakurichi reported only 18%.

B. Persons trained to use field test kits

Figure 41: Persons trained to use field test kits

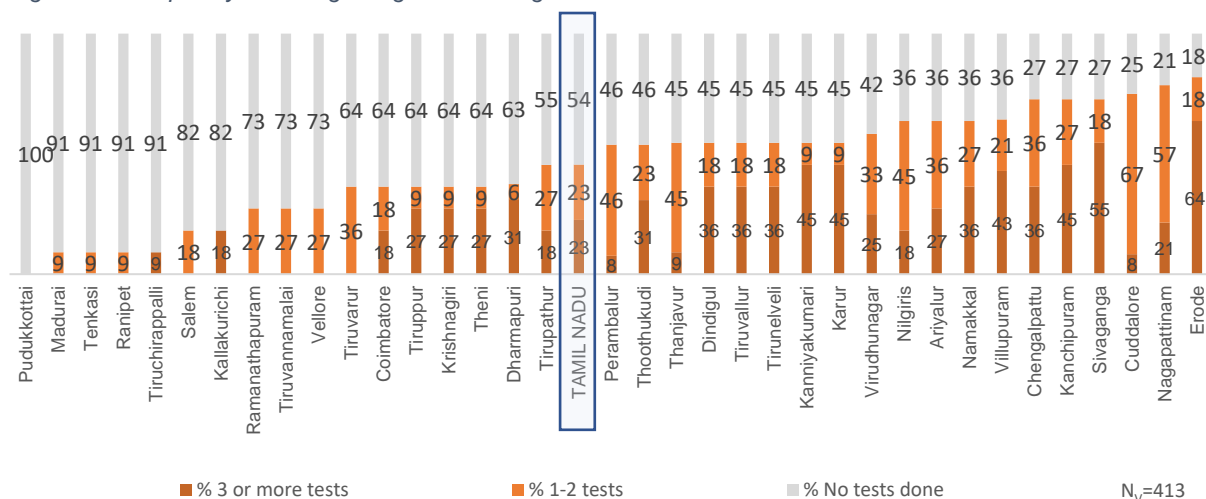


Overall, **62% of villages** in the state reported to have either VWSC/Pani Samiti or pump operator trained to use field test kits for testing the quality of water on-site. Tiruppur, Nagapattinam and Nilgiris reported 100% VWSC/Pani Samiti or pump operator trained to use field test kits while Pudukkottai and Kallakurichi reported 9% each.

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

Across the state, about one-fourth of the total sampled villages (23%) 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, Erode had the highest proportion of such villages, wherein 64% of its villages reported using FTKs three or more times in last one year.

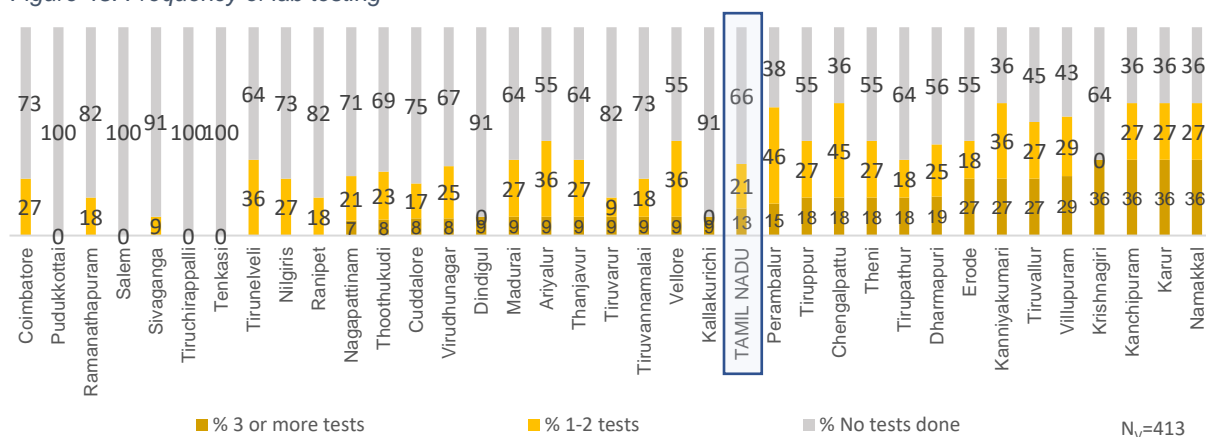
Figure 42: Frequency of testing using FTK in villages



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

Across the state, less than 15 percent of the total sampled villages (13%) 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, Karaikul, Karur, Kanchipuram and Krishnagiri had the highest proportion of such villages, wherein 36% of its villages reported tests through laboratories - three or more times in last one year.

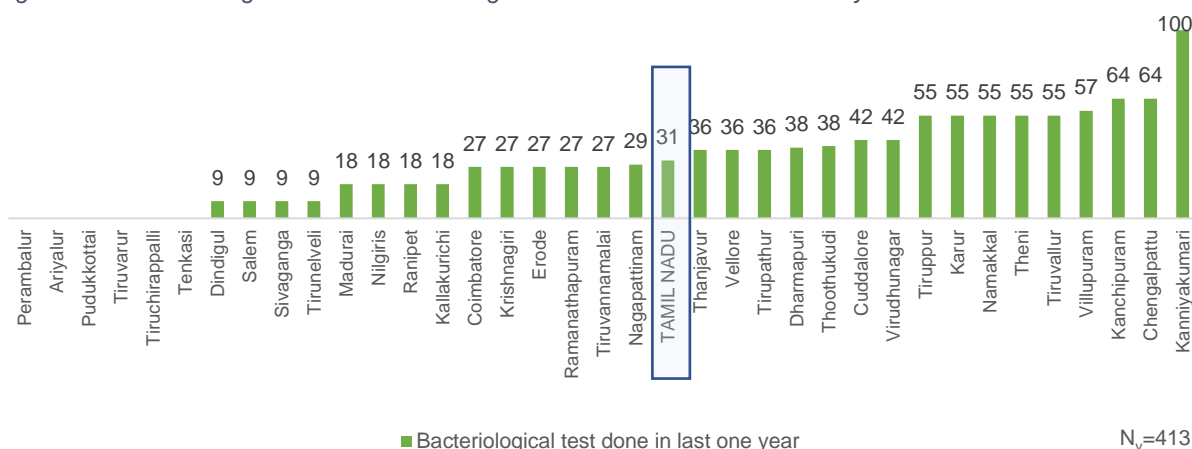
Figure 43: Frequency of lab testing



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

With regards to water quality testing in the village by VWSC, **31% villages** in the state reported having bacteriological test done in the last one year.

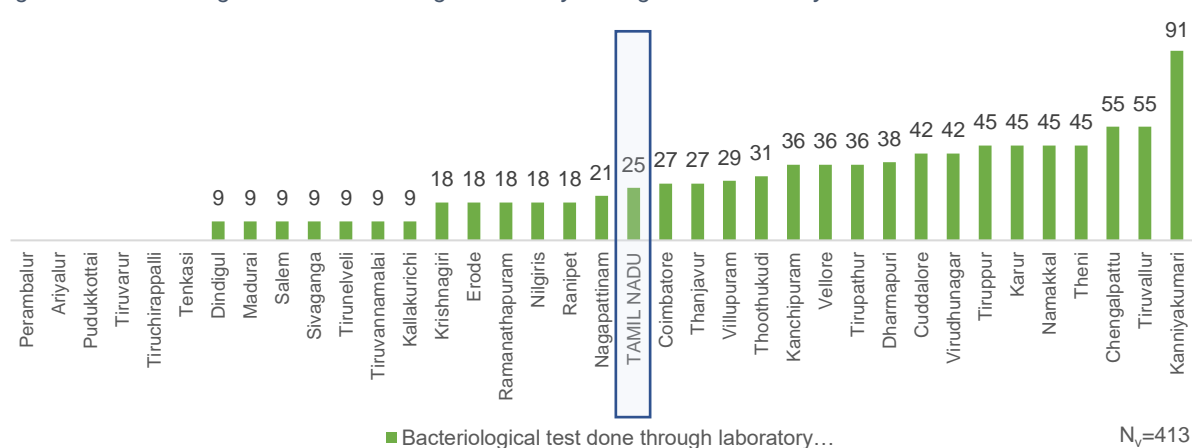
Figure 44: Percent villages in which Bacteriological test was done in the last one year



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 25% of sampled villages. All sampled villages from the districts Kanyakumari reported to have had bacteriological tests done through laboratories in last one year.

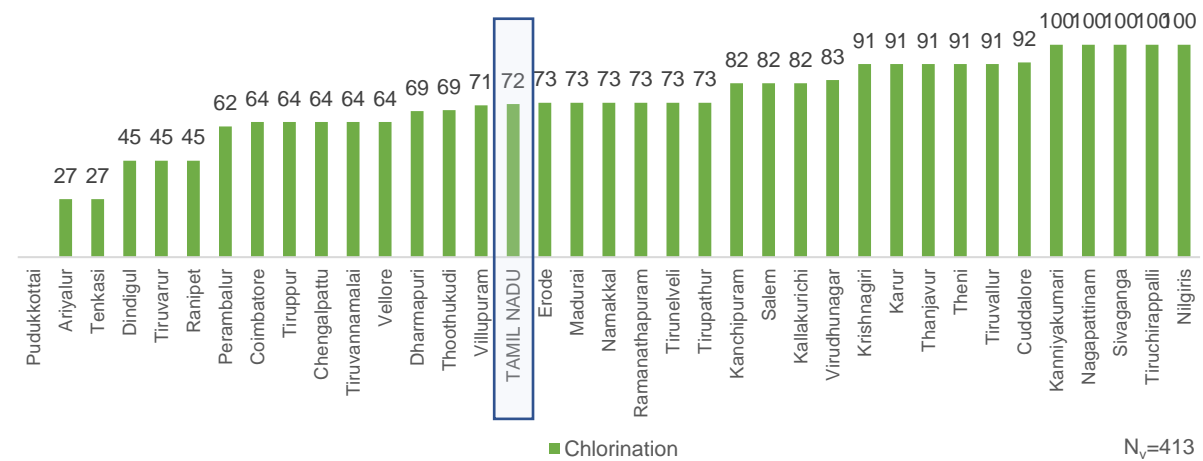
Figure 45: Bacteriological test done through laboratory testing in the last one year



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

More than **72% villages** reported that there is availability of chlorination mechanism in the village but during onsite testing of water at household level only 32% households tested to have for presence of chlorine.

Figure 46: Villages having a mechanism for chlorination

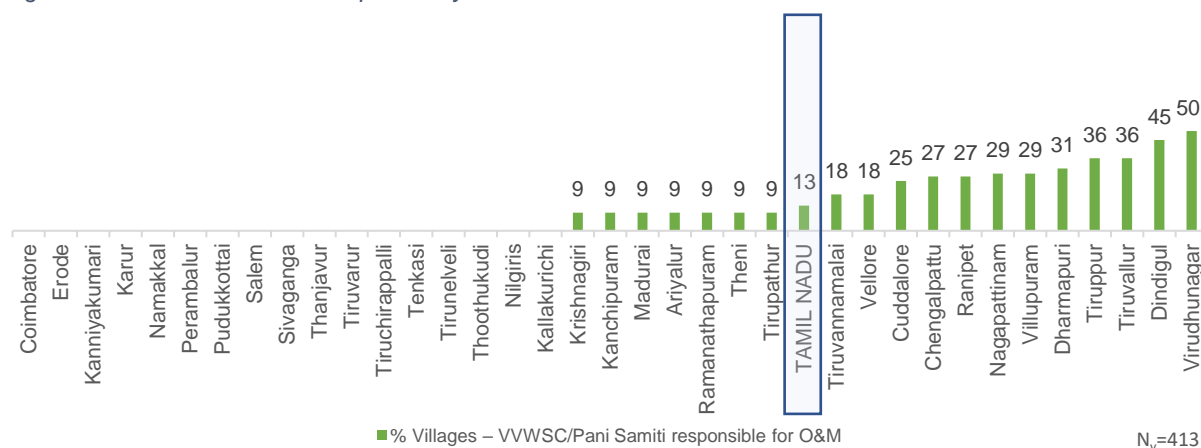


3.7. Management of water service delivery at village level

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

In the state, **9% villages** that have VWSC/Pani Samiti reported to be responsible for operation and maintenance of PWS. Virudhunagar district reported that 50 percent of VWSC/Pani Samiti are responsible for operation and maintenance of PWS.

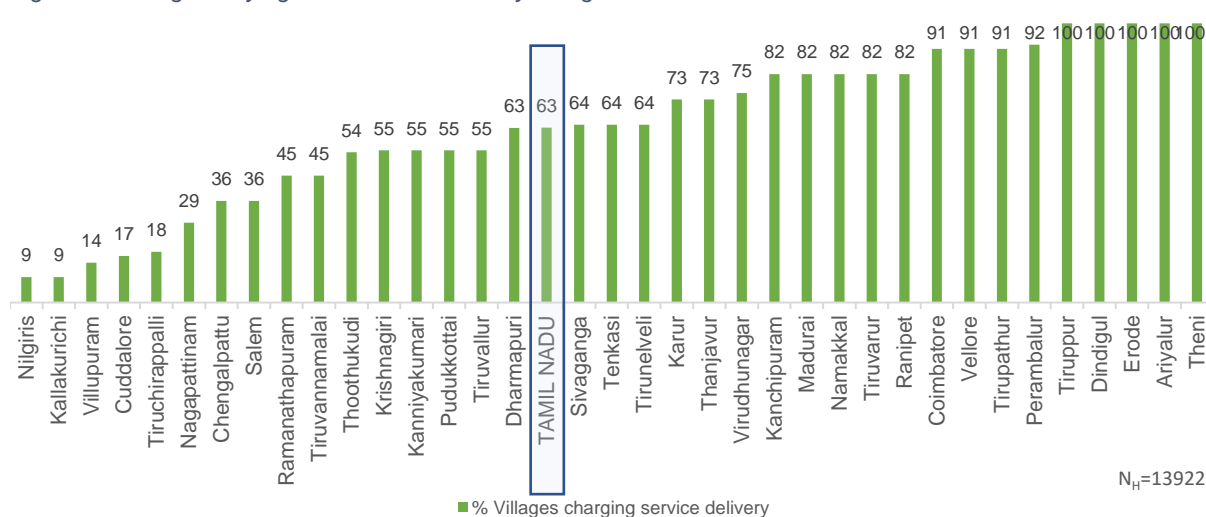
Figure 47: VWSC/Pani Samiti responsibility for O&M of PWS schemes



B. Villages levying water service delivery charges from households

Overall, **63% of villages** in the state levy charge for water service delivery to households whereas **53% HHs** reported paying water service delivery charges at the households.

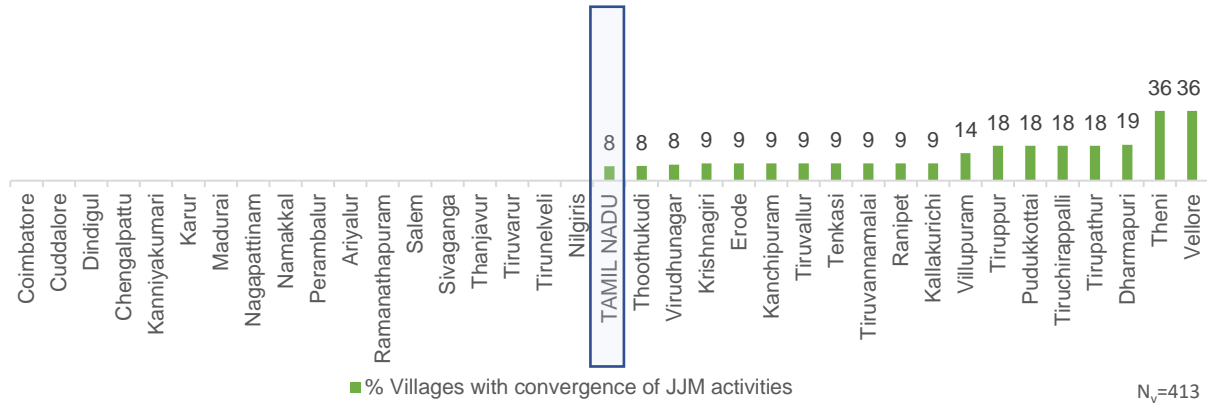
Figure 48: Villages levying water service delivery charges from households



C. Convergence of JJM activities with other schemes in villages

In the state, only **8% 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.

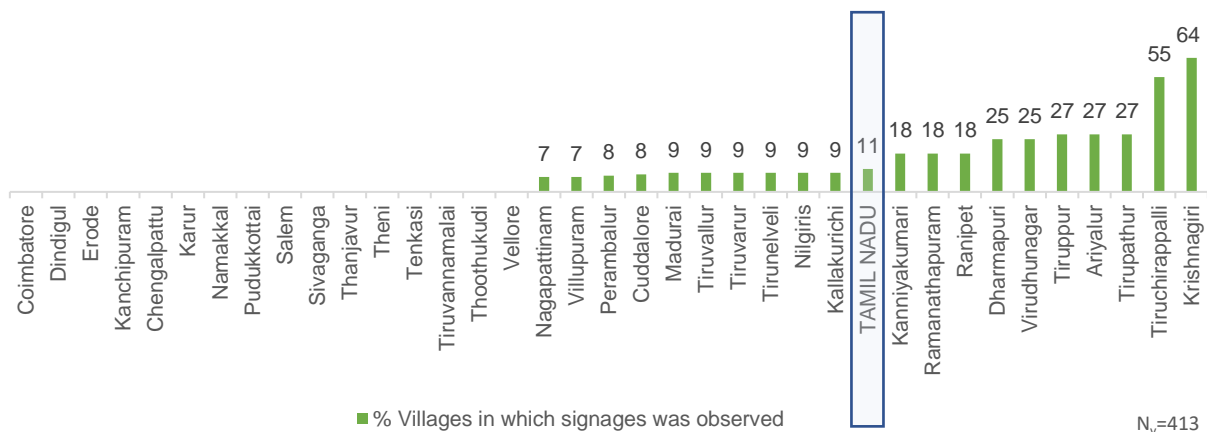
Figure 49: Village reported convergence of JJM activities with other schemes in the village



D. Villages where signages were observed

Signages about JJM were observed in 11% of the sampled villages. District Krishnagiri had the highest proportion of villages where signages were observed (64%).

Figure 50: Villages in which signages about JJM was observed

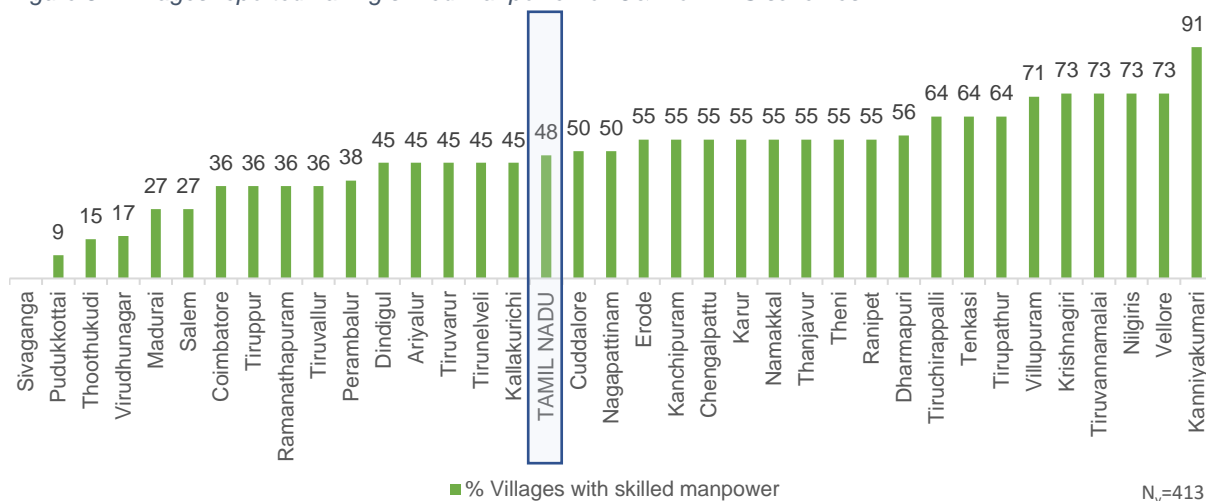


3.8. Status of Operation & Maintenance

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

Across the state, **48% villages** in the reported having identified skilled manpower for O&M of PWS schemes, the most reported to be in Kaniyakumari (91%) and the least in Pudukkottai (9%).

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



B. Villages with O&M challenges

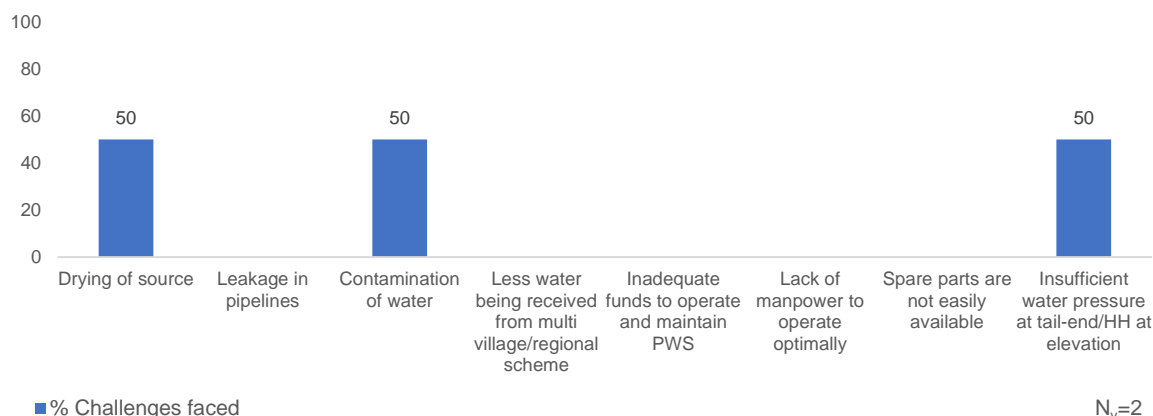
In the state, **0.5% of villages** in the state reported to have faced challenges with respect to O&M of PWS schemes

Figure 52: Villages reported having faced O&M challenge



C. Details of challenges faced

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

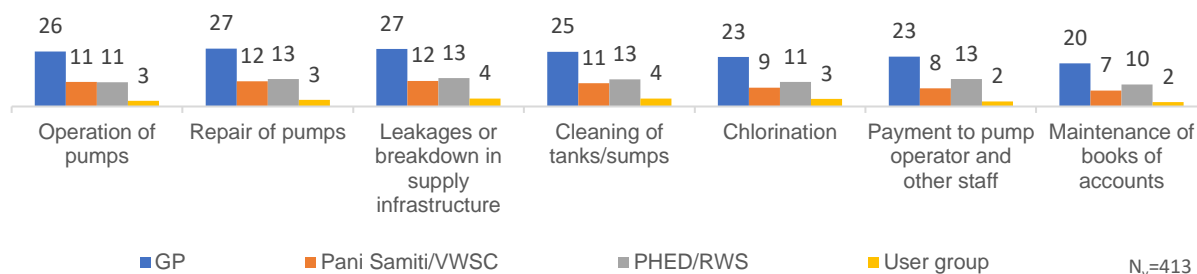


Out of the 0.5% of villages that had faced challenges with respect to O&M of PWS schemes (2 villages), 'drying of source, contamination of water and insufficient water pressure' was attributed the most – at 50%.

D. 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.

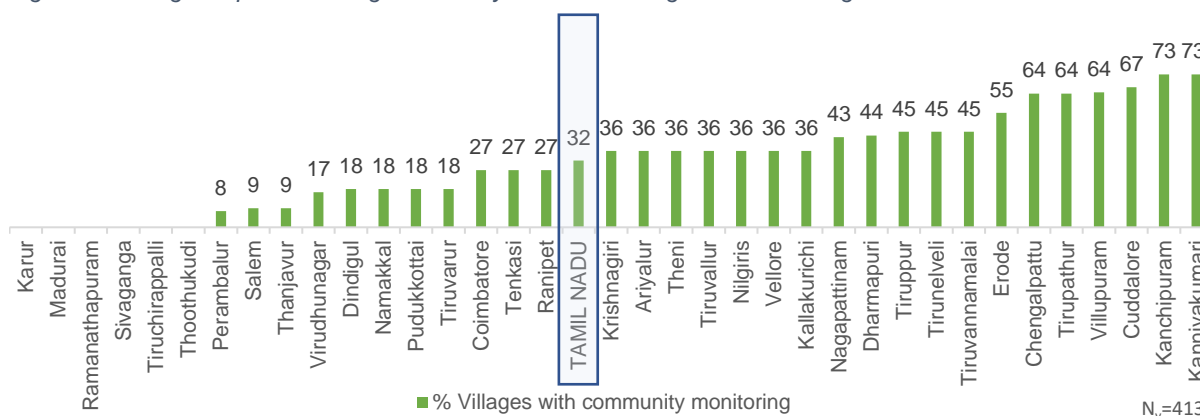
Figure 54: Different bodies responsible for O&M



E. Villages with community level monitoring of water wastage

32% 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

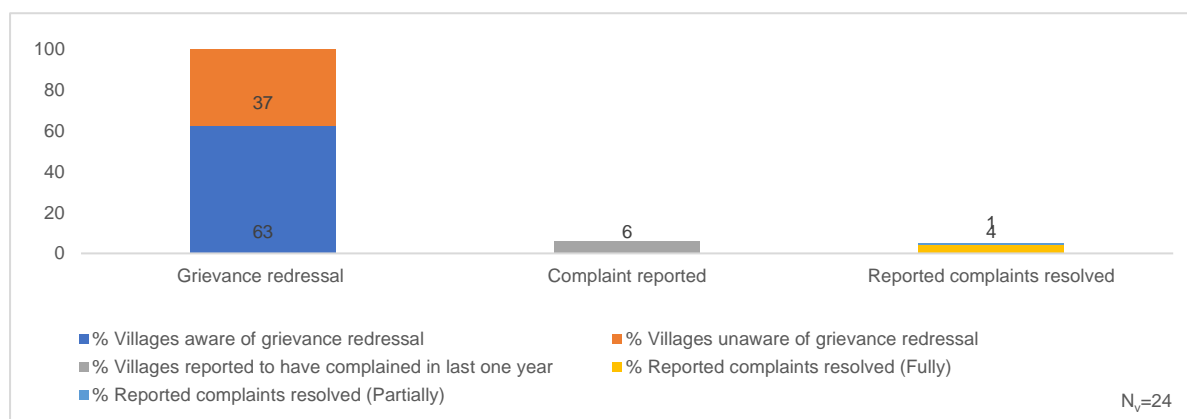


3.9. Status of service delivery related grievances and redressal

A. Village level

Grievance redressal at village

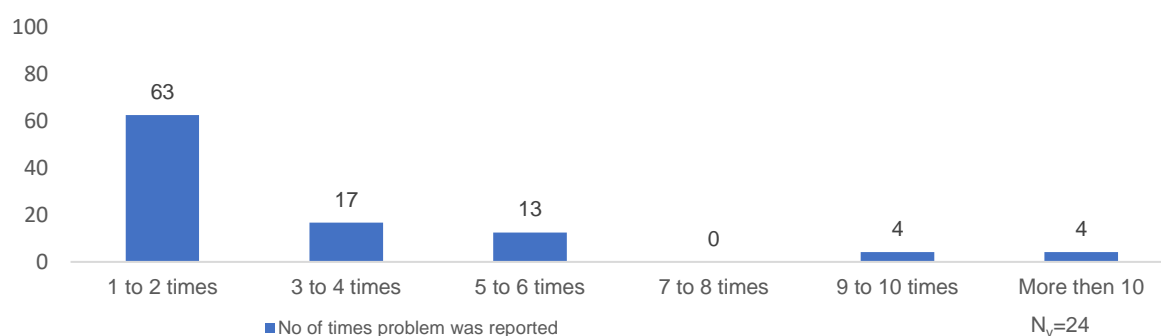
Figure 56: Reporting of grievance redressal at village level



In the state, **63% of villages** reported that they are aware of any grievance redressal mechanism, but only 6% HHs have reported a complaint in the last one year amongst which 4% 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

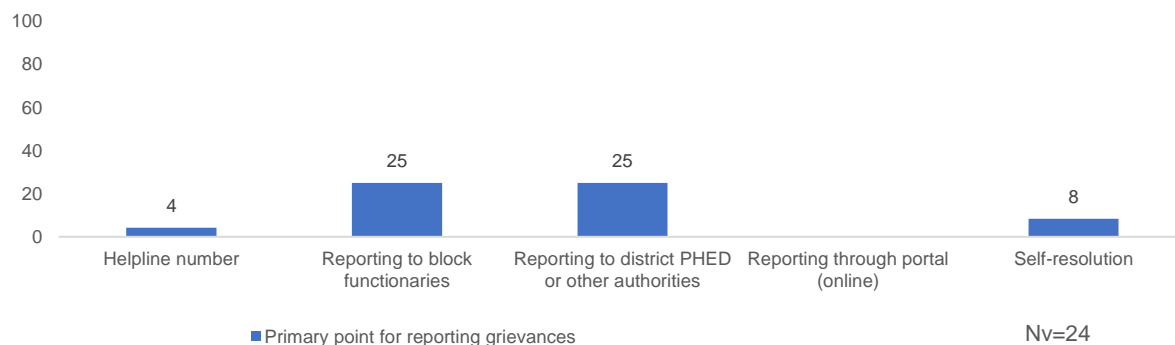


Among the villages who reported a complaint (i.e., 24 villages), 63% villages have reported a complaint once or twice times in the last one year, while 17% reported a complaint at least two or three times.

Primary points for reporting grievances

Among those who reported complaint (i.e., 6% HHs, 24 villages), **25% of villages** reported that they report their grievances to **district PHED and block functionaries** beside other reporting-points.

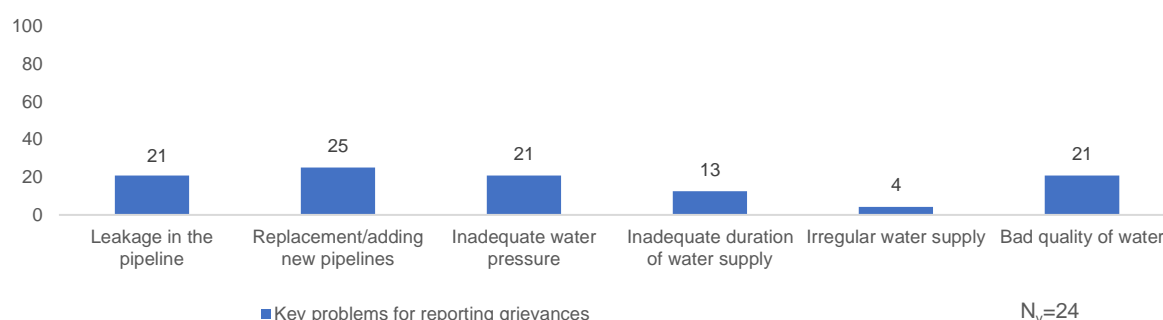
Figure 58: Primary points for reporting grievances by village



Key problems for reporting grievances

Overall, among those who reported complaint (i.e., 6% HHs, 24 villages) **80% of villages** reported that **leakage in the pipeline** is their most encountered problem for reporting grievances

Figure 59: Key problems reported by village

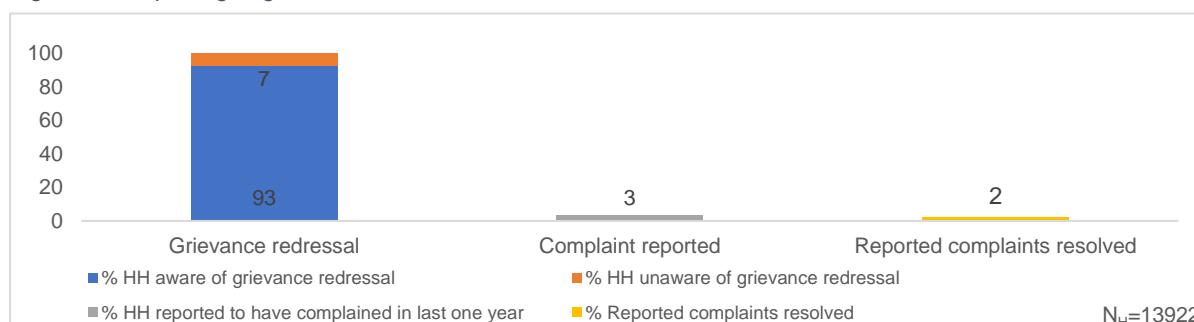


B. Household level

Awareness of grievance redressal at household

In the state, **93% of HHs** reported that they are aware of any grievance redressal mechanism w.r.t. HH tap water through PWS, but only 3% HHs have reported a complaint in the last one year and only 2% of complaints have been resolved.

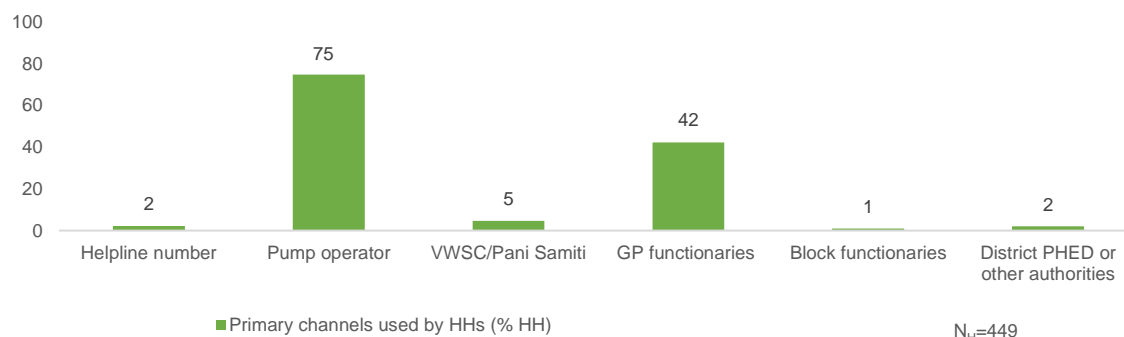
Figure 60: Reporting of grievance redressal at household level



Primary channels for reporting grievances by households

Among those who reported complaint as shown in the above graph (i.e., 3% HHs, 255 HHs), **75%** of the HHs reported their complaints to the **pump operators** beside other reporting-channels

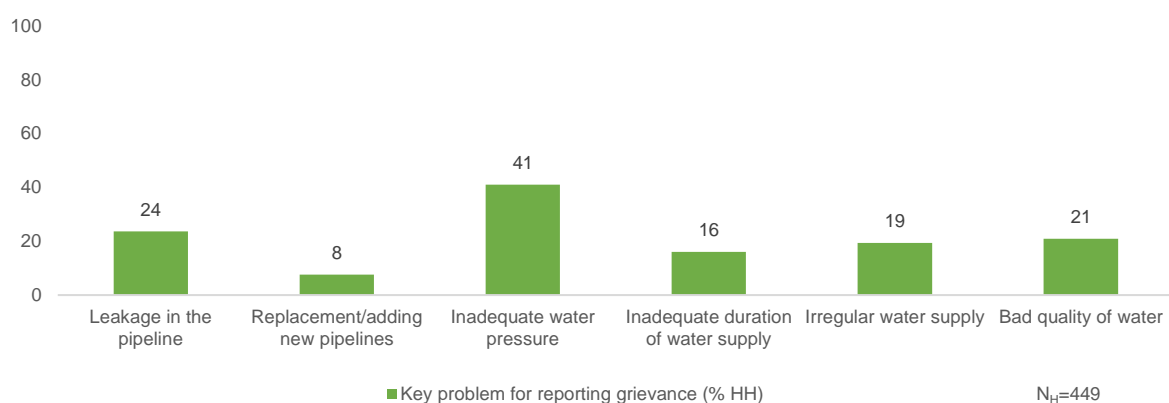
Figure 61: Primary channels for reporting grievances by households



Key problems for reporting grievances

Overall, among those who reported complaint (i.e., 3% HHs, 255 HHs) **41%** of the HHs that reported problems was of **inadequate water pressure** beside other problems

Figure 62: Key problems reported by households

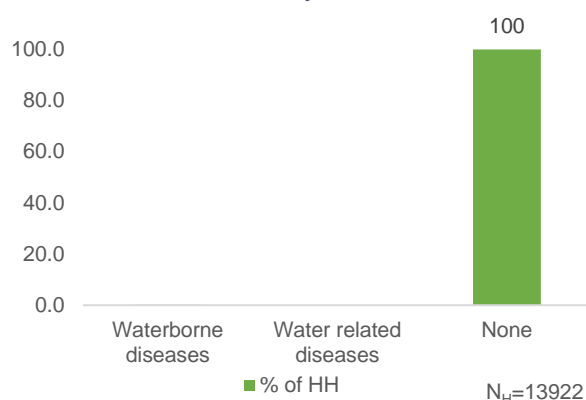


3.10. Perception of HHs on Outcome Indicators

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

Across the state less than 0.5% 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

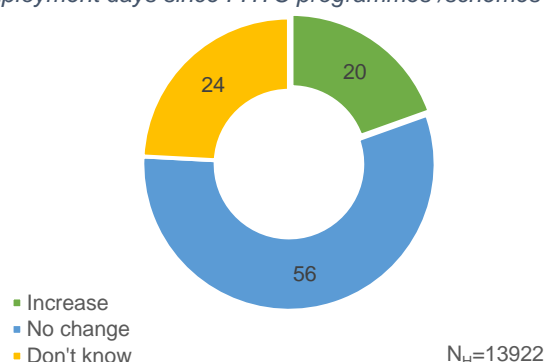
Figure 64: Household reported incidence of water borne diseases in last one year



B. Change in employment days since FHTC programmes/schemes

Since having a functional HH tap connection, 20% HHs across the state has reported that there has been a change in the no. of employment days of the adult HH members while 56% HHs reported no change

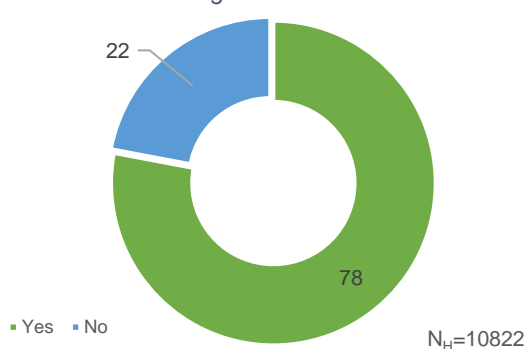
Figure 63: Household reported a change in employment days since FHTC programmes /schemes



C. Reduction in time and effort in collecting water

Out of the HHs reported (i.e., 10822) that female members used to fetch water before HH tap connection, 78% reported that post installation of HH tap connection it helped reduction of time and effort in collection of water

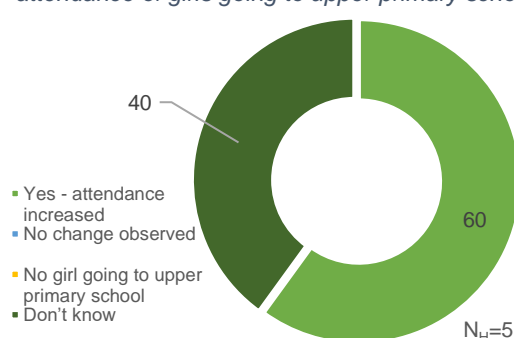
Figure 66: Households reported reduction in time and effort in collecting water



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

Across the state, 60% HHs reported that since having a functional HH tap connection the attendance of the girls going to schools increased, while 40% HHs reported don't know in attendance which could possibly be an impact of shutting down of schools due to COVID-19 related lockdown during the survey

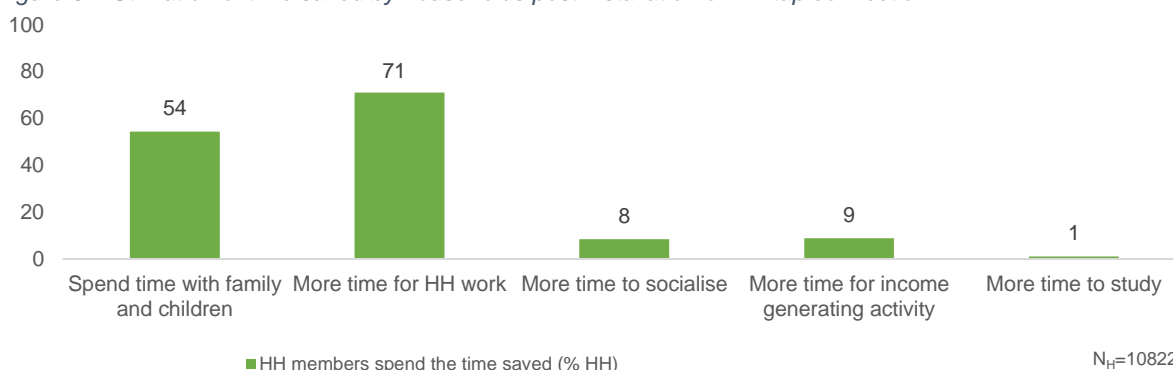
Figure 65: Households reported increase of attendance of girls going to upper primary school



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 (71%).

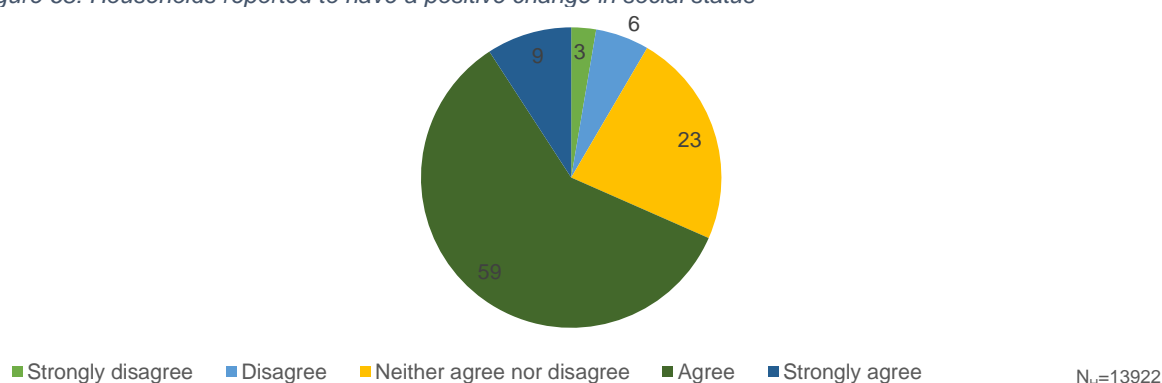
Figure 67: Utilization of time saved by households post installation of HH tap connection



F. Change in social status

Sense of pride and positive change in social status was reportedly realized by 58% of HHs post the installation of HH tap connections.

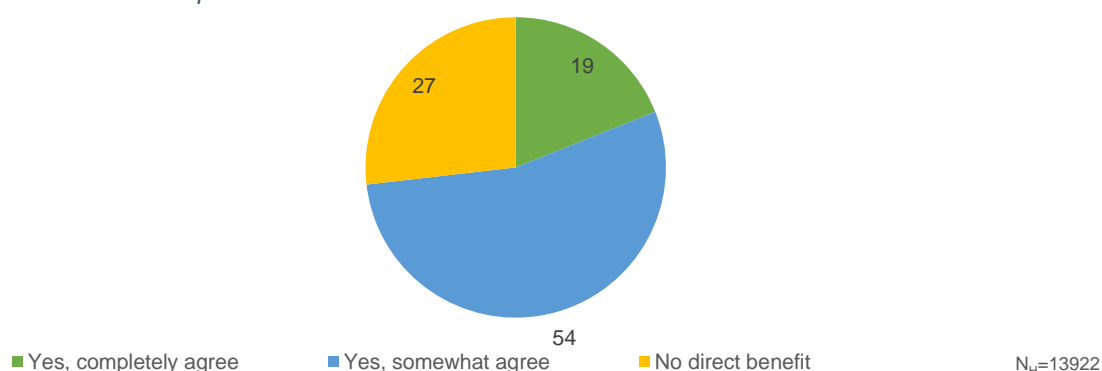
Figure 68: Households reported to have a positive change in social status








G. Direct benefits in terms of income due to FHTC

Across the state, 24% 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 39% 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 =13922)		In %
1	Regularity		93.1
2	Overall quality		91.2
3	Colour		94.5
4	Taste		89.4
5	Odour		95.2

Note:

Base (N_v)=413 means all villages sampled and covered in Tamil Nadu state

Base (N_H)=13922 means all households sampled and covered across the 413 villages in Tamil Nadu state

Base (N_H)=13863 means all households sampled where water sample be collected across the 413 villages in Tamil Nadu state

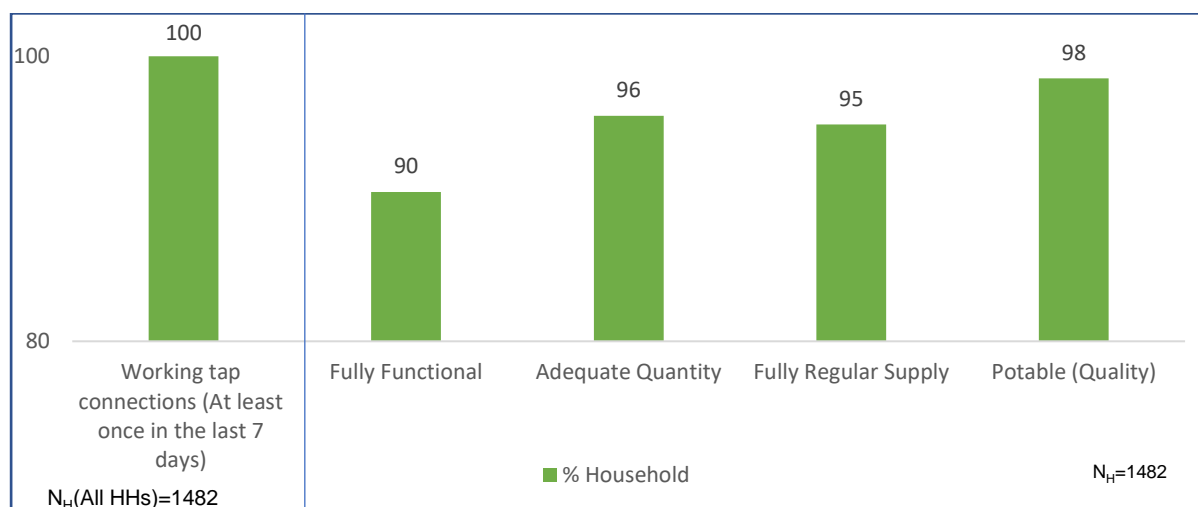
Base (N_H)=10822 means all households sampled where female members used to fetch water before HH tap connection

Base (N_H)=5 means all households sampled that had adolescent girls as one of HH members

4. Status of functionality in Har-Ghar-Jal villages

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 HGJ district, N_H=1482 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=1482) had working tap connections. 90 percent HHs in the state were found to have fully functional HH tap water connection. Moreover, almost all the households (96 percent) received adequate quantity (≥ 55 LPCD) of water supply and more than 9 out of 10 received regular supply (95 percent) of water. The on-site testing and lab test results of the water indicates that more than 9 out of 10 (98%) 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.	Tiruppur	100	56	58	97	100
2.	Cuddalore	100	73	97	100	76
3.	Dindigul	100	50	53	86	100
4.	Erode	100	100	100	100	100
5.	Kanchipuram	100	91	99	93	99
6.	Chengalpattu	100	99	99	100	100
7.	Karur	100	100	100	100	100
8.	Nagapattinam	100	100	100	100	100
9.	Perambalur	100	99	100	100	99
10.	Ariyalur	100	97	100	100	97
11.	Salem	100	99	100	99	100
12.	Thanjavur	100	100	100	100	100
13.	Theni	100	40	78	49	100
14.	Tiruvallur	100	97	100	97	100
15.	Tiruchirappalli	100	89	89	100	100
16.	Tirunelveli	100	100	100	100	100

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)
17.	Tiruvannamalai	100	92	92	100	100
18.	Thoothukudi	100	100	100	100	100
19.	Ranipet	100	100	100	100	100
20.	Vellore	100	97	99	100	99
21.	Tirupathur	100	100	100	100	100
22.	Villupuram	100	99	100	99	100
23.	Kallakurichi	100	94	100	94	100
24.	Tamil Nadu	100	90	96	95	98

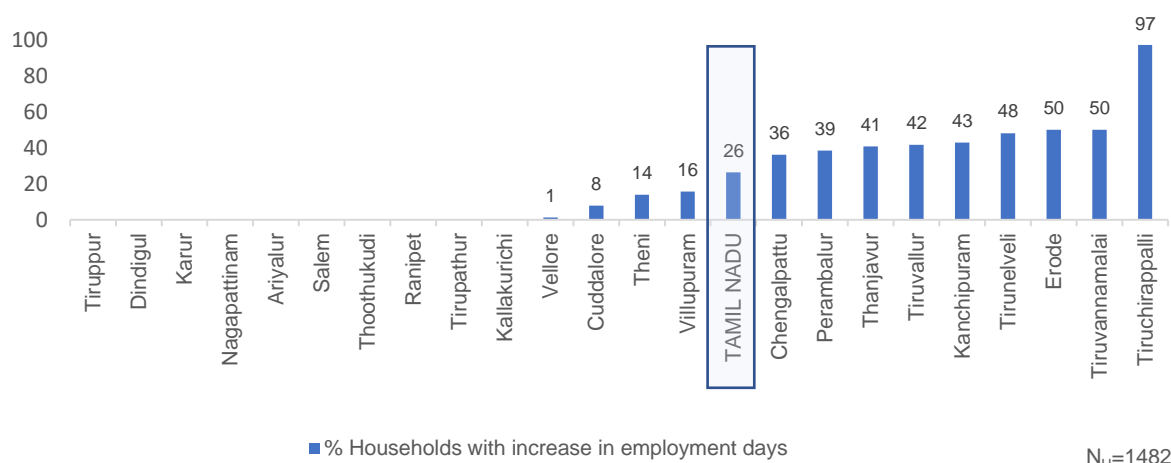
Potable water has been considered basis testing of water samples through laboratory tests for physical, chemical, and bacteriological as given in Table 4 parameters (within acceptable/ permissible range) and onsite testing of pH. The details of laboratory test are mentioned in the table given above in 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, 26% of the sampled households reported that employment days increased since the installation of FHTC.

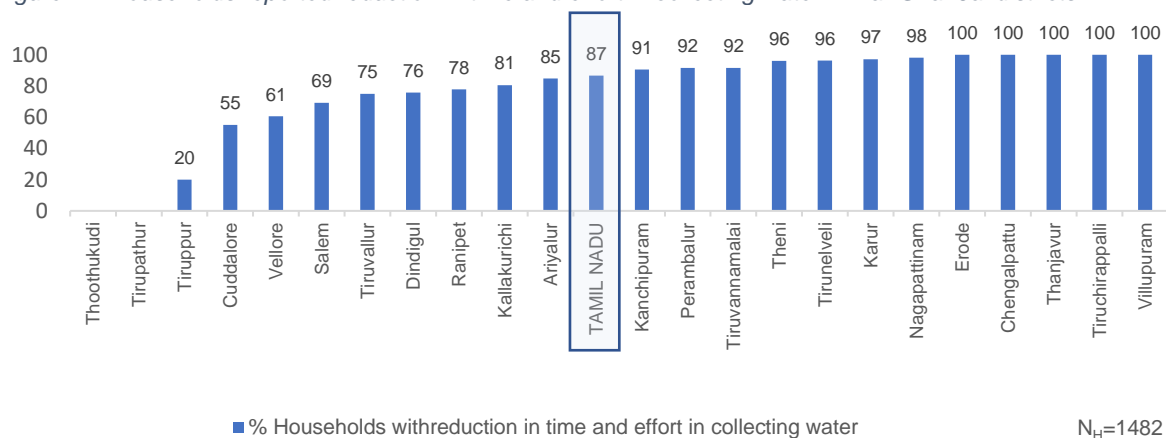
Figure 70: Household reported a change in employment days since FHTC programmes /schemes in Har Ghar Jal districts



B. Reduction in time and effort in collecting water

Similarly, about 87% of the sampled households also reported that the effort and time in collecting water reduced after installation of FHTC.

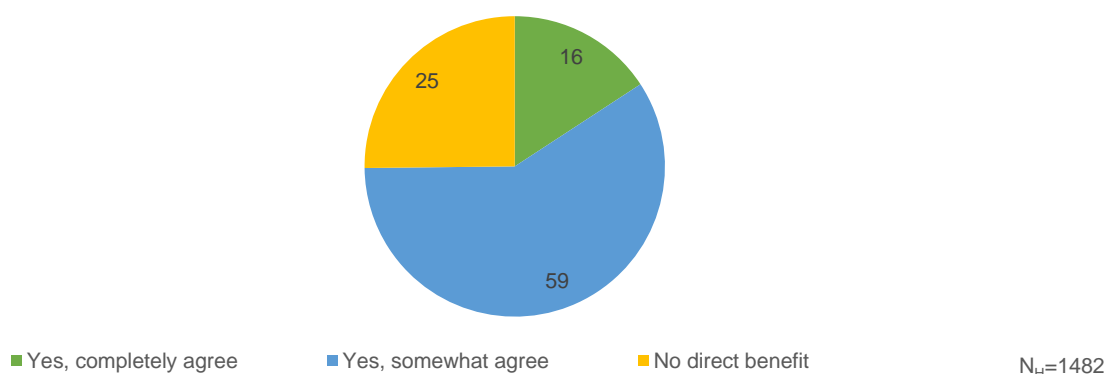
Figure 71: Households reported reduction in time and effort in collecting water in Har Ghar Jal districts



4.3. Direct benefits in terms of income due to FHTC

Across the nation, 16% 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 59% reported being in partial agreement against the same.

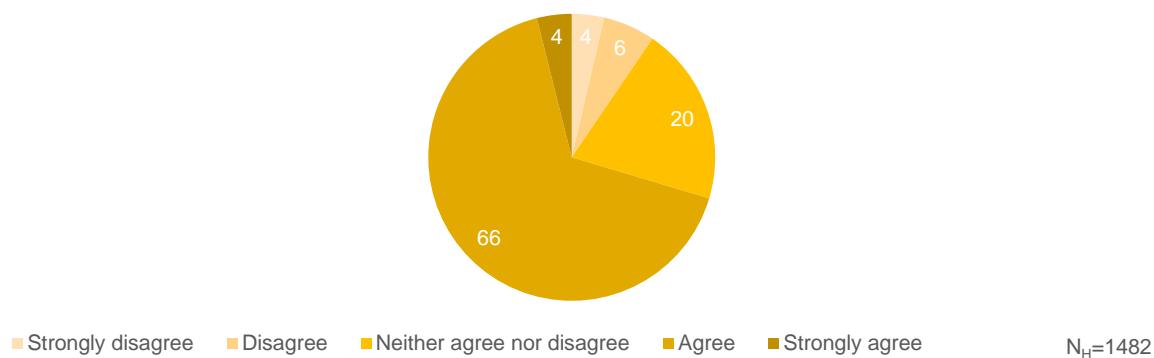
Figure 72: Households reported to have received direct benefits in terms of income due to FHTC in Har Ghar Jal districts



4.4. Change in social status

About 7 out of 10 of the households felt HH tap connection earned them more respect, feeling of pride and brought a positive change in their social status.

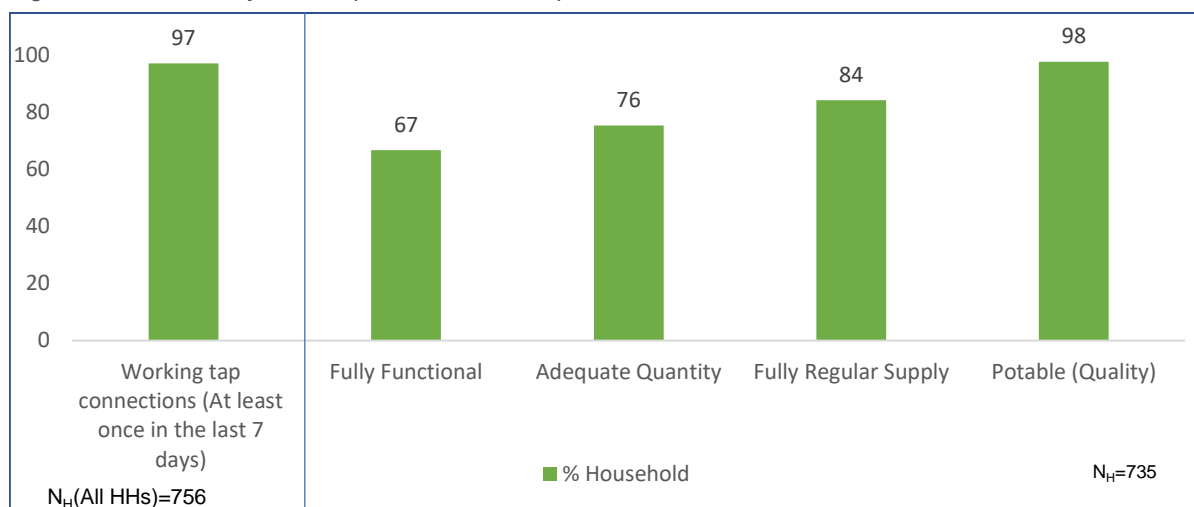
Figure 73: Households reported to have a positive change in social status in Har Ghar Jal districts



5. Status of functionality in 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_H=735 implies all HHs where water was found on the day of the survey.

It has been found that 97 percent of the sampled HHs (N=756) had working tap connections. 67 percent HHs in the state were found to have fully functional HH tap water connection. Moreover, more than three-fourth of the households (76 percent) received adequate quantity (≥ 55 LPCD) of water supply and more than 4 out of 5 received regular supply (84 percent) of water. The on-site testing and lab test results of the water indicates that about 9 out of 10 (98%) sampled households in the state receive potable water.

Table No. 9: 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.	Virudhunagar	100	63	74	82	98
2.	Tamil Nadu	97	67	76	84	98
3.	Ramanathapuram	94	71	77	87	97

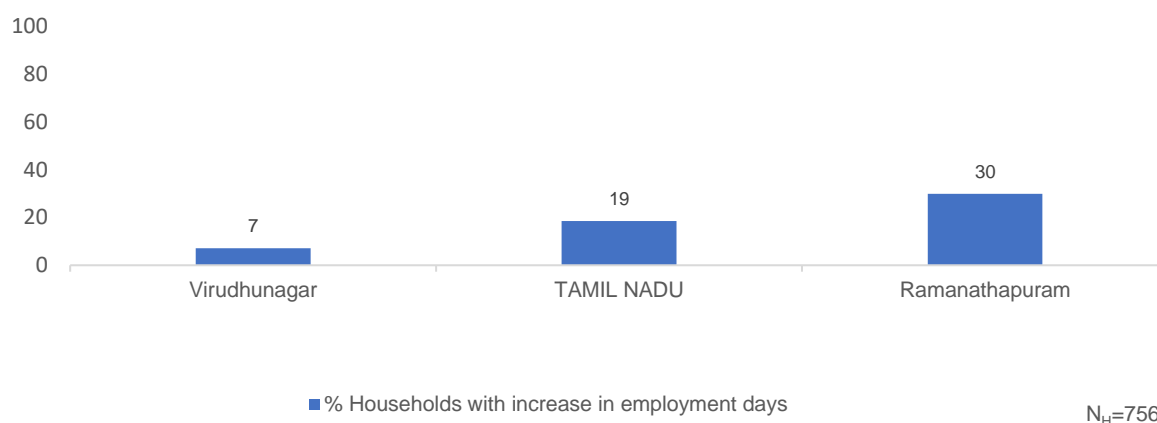
Potable water has been considered basis testing of water samples through laboratory tests for physical, chemical, and bacteriological as given in Table 4 parameters (within acceptable/ permissible range) and onsite testing of pH. The details of laboratory test are mentioned in the table given above in the glossary.

5.2. Perception of HHs from aspirational districts on Outcome Indicators

A. Change in employment days since FHTC programmes/schemes

Only around 19 percent of the households in aspirational districts reported increase in employment days since installation of FHTC.

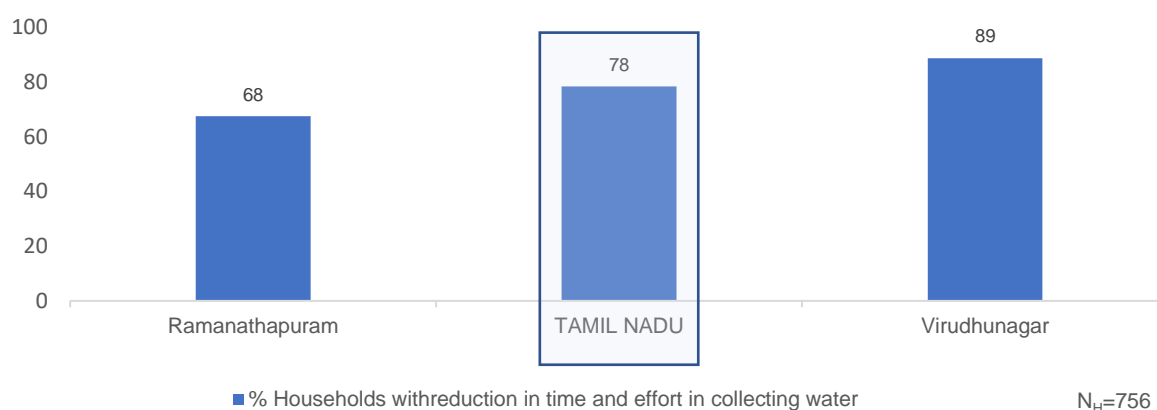
Figure 74: Household reported a change in employment days since FHTC programmes /schemes in Aspirational districts



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.

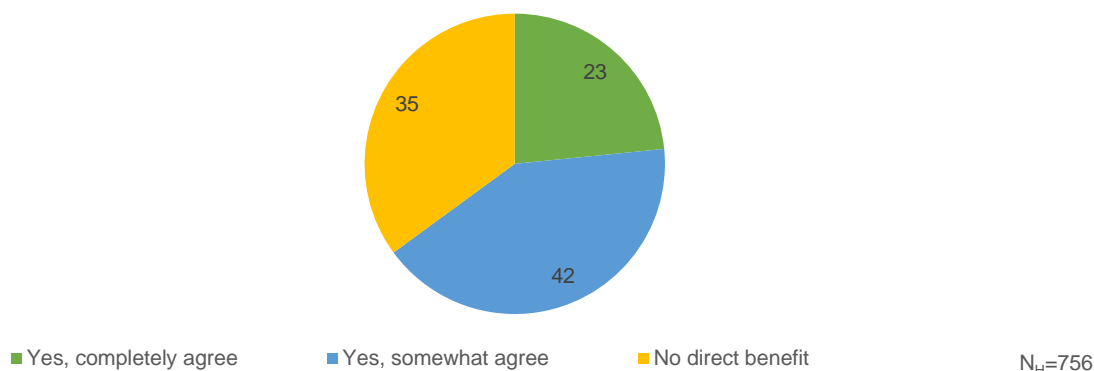
Figure 75: Households reported reduction in time and effort in collecting water in Aspirational districts



5.3. Direct benefits in terms of income due to FHTC

Across the state, 23% 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 42% reported being in partial agreement against the same.

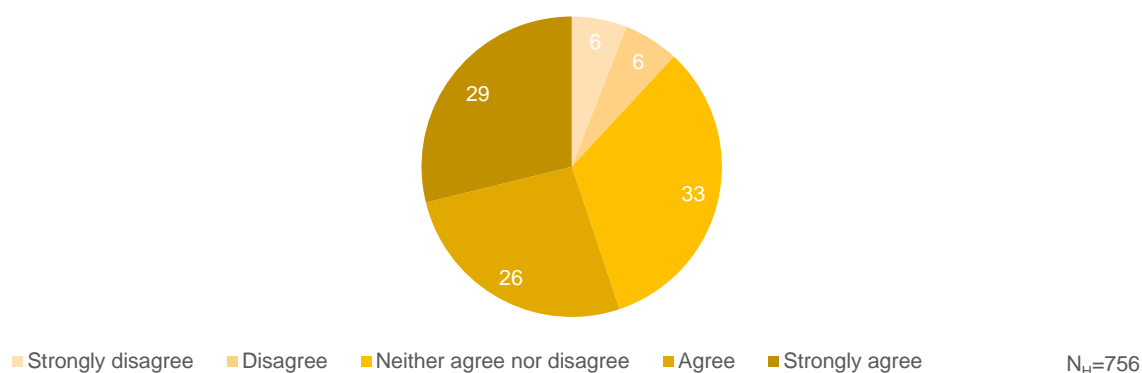
Figure 76: Households reported to have received direct benefits in terms of income due to FHTC in Aspirational districts



5.4. Change in social status

More than half 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.

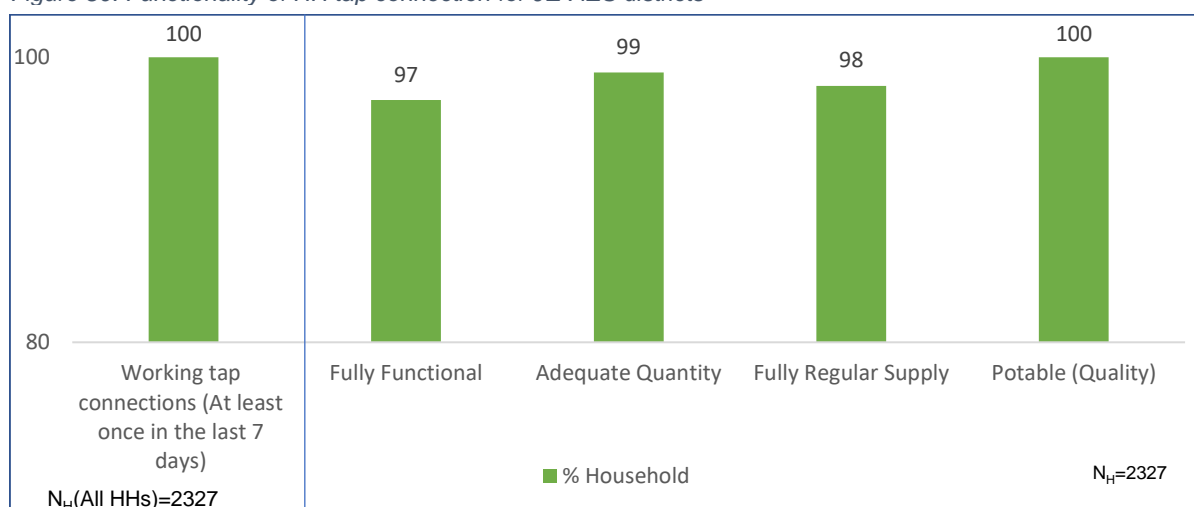
Figure 77: Households reported to have a positive change in social status in Aspirational districts



6. Status of functionality in JE-AES affected villages

6.1. Overall Functionality (in %)

Figure 80: Functionality of HH tap connection for JE-AES districts



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

Please note: For JE-AES district, N_H=2327 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=2327) had working tap connections. 97 percent HHs in the state were found to have fully functional HH tap water connection. Moreover, almost all the households (99 percent) received adequate quantity (≥ 55 LPCD) of water supply and about 9 out of 10 received regular supply (98 percent) of water. The on-site testing and lab test results of the water indicates that all (100%) sampled households in the state receive potable water.

Table No. 10: Quantity, Regularity, and Quality of FHTC for JE-AES 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.	Karur	100	100	100	100	100
2.	Madurai	100	92	96	96	99
3.	Thanjavur	100	98	99	99	99
4.	Tiruvarur	100	99	100	100	100
5.	Villupuram	100	95	100	96	100
6.	Kallakurichi	100	97	98	99	99
7.	TAMIL NADU	100	97	99	98	100

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.

6.2. Perception of HHs from JE-AES districts on Outcome Indicators

A. Change in employment days since FHTC programmes/ schemes

Only around 17 % of the households in JE-AES affected districts reported increase in employment days since installation of FHTC.

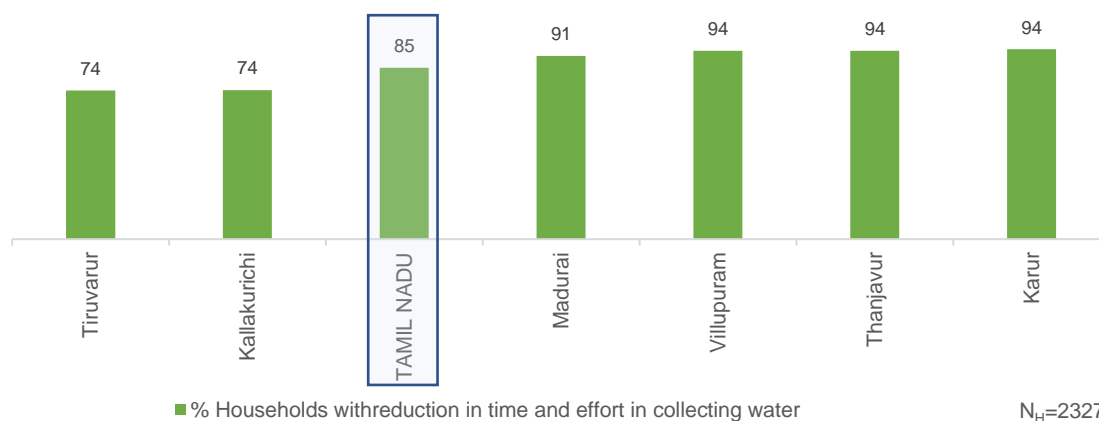
Figure 78: Household reported a change in employment days since FHTC programmes /schemes in JE-AES districts



B. Reduction in time and effort in collecting water

Only around 85 % of the households in JE-AES affected districts reported reduction in time and effort in collecting water.

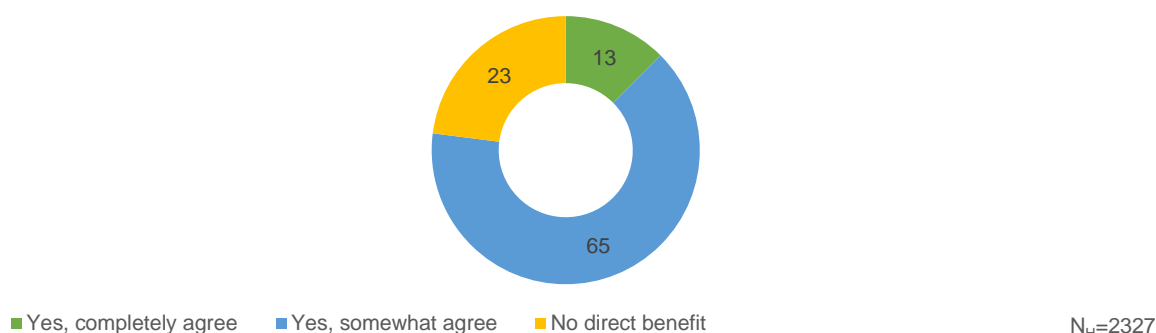
Figure 79: Households reported reduction in time and effort in collecting water in JE-AES districts



6.3. Direct benefits in terms of income due to FHTC

Across the state, 13% of sampled HHs from JE-AES affected districts reported being in complete agreement that there had been direct benefits on their HH income since the installation of HH tap connection, while 65% reported being in partial agreement against the same.

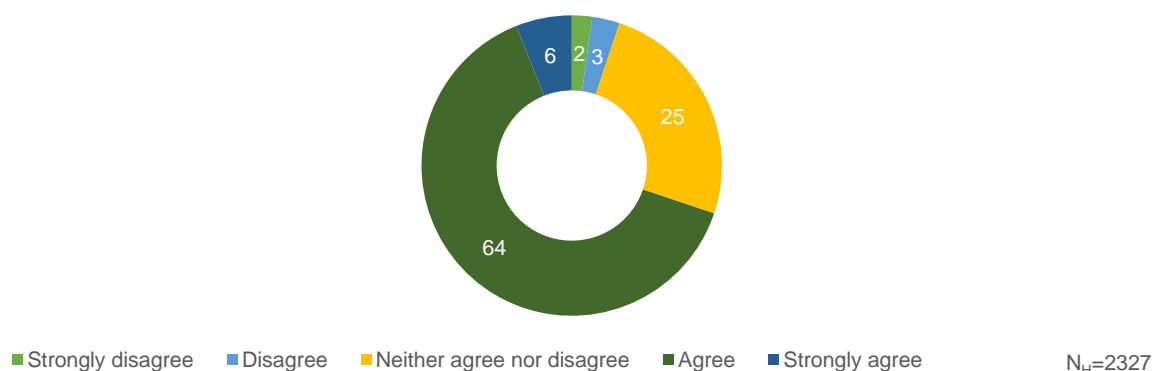
Figure 80: Households reported to have received direct benefits in terms of income due to FHTC in JE-AES districts



6.4. Change in social status

7 out of ten households in JE-AES affected districts felt HH tap connection earned them more respect, feeling of pride and brought a positive change in their social status.

Figure 81: Households reported to have a positive change in social status in JE-AES districts



7. Annexure

Table No. 11: List of replaced villages				
S. No.	District Name	Village Name	Status of the Scheme (No Scheme/Replaced & Defunct)	Remarks
1	Ramanathapuram	Arunuthimangalam	No Scheme	No Scheme present in the sampled village, hence replaced with Village-Chittrakkottai. Scheme found to be functional in replacement village
2	Nilgiris	Thengumarahada	No Scheme	No Scheme present in the sampled village, hence replaced with Village-Denad. Scheme found to be functional in replacement village
3	Tirupathur	Matrapalli	No Scheme	No Scheme present in the sampled village, hence replaced with Village-Mottur. Scheme found to be functional in replacement village