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

Har Ghar Jal
Jal Jeevan Mission

STATE REPORT: ANDAMAN AND NICOBAR ISLANDS

SURVEY DURATION: MARCH TO APRIL 2022

Contents

Abbreviations

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

Glossary

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

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

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

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

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

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

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

Executive Summary

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

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

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

The UT of Andaman and Nicobar Islands lies in the south eastern part of India and has a population of 3,80,581 people (Census 2011). It has 3 districts and 266 villages, and all the villages have PWS schemes. The state is yet to achieve the Har Ghar Jal status. A total of 144 villages, across all districts, and 1557 households were randomly sampled for the survey, and additionally, water samples from 31 public institutions were tested.

In the assessment among sampled villages, 69 percent of villages have only one scheme, 29 % have 2-3 schemes, and 1% have 4 and more schemes. Mostly all schemes across the state were found functional.

At the UT level, more than 87% of the HHs were satisfied with the regularity, 88% with the quality of the water, 91% colour with the colour of the water supplied, and 91% with the taste of the supplied tap water.

Overall functionality status of Andaman and Nicobar Islands

At the state level, 100% of HHs received water on the day of the survey. While 40% of the HHs were found to have fully functional tap water connections within the premises. Out of which 48% received an adequate quantity of water, 85% reported receiving a fully regular supply of water, and 90% HHs received potable water.

It was found that more than 3% of households received water all 7 days a week and 78% received at least 3 to 4 days, while 5% of the HHs received water once a week. The average duration of water supply across the state was reported to be 1 hours per day.

In Andaman and Nicobar Islands, 23% of the villages have reported that water is directly supplied to the households and the remaining 77% reported that water was supplied via an overhead tank, sump, or both.

During the roll-out of the data collection in the UT, all-district level NABL accredited laboratories (labs) extended their support in accepting and testing water samples from HHs and public institutions. One of the challenges identified by the labs was the capacity to test more than 30-40 samples within 24 hours given the shortage of technicians and availability of necessary reagents in the required quantity. In Andaman and Nicobar Islands, 1588 samples of water were submitted, and 852 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 3% of the HHs. The percentage was relatively higher in Schools (more than 23%), wherein there is a possibility of additional chlorine being added locally for the purification of water. Even if 90% of samples passed in bacteriological parameter the RC was found only in 3%, which means the protection against the risk of bacteriological contamination from source to point of consumption is not provided to HHs. A monitoring system to ensure the correct dosing of chlorine in the pipe water supply system is necessary for assuring potable water.

Out of the 1557 HHs sampled for the FHTC assessment, a water quality test was carried out in all 1557 HHs on the day of the survey. pH was found within the acceptable limit in 99% of households. Among the public institution, pH was found in the acceptable limit all AWC and schools.
23% of villages in the state reported having available field test kits. And less than one-fifth (19%) 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 5% of villages in the state reported having a VWSC or a Pani Samiti out of which 43% of the VWSC/Pani Samitis reported to have more than 50% female members. In the UT, no villages reported that VWSC/ Pani Samiti is responsible for the operation and maintenance of pipe water supply.

19% of villages reported having identified skilled manpower for O&M of PWS schemes. 19% of villages in the UT reported having faced challenges with respect to O&M of PWS schemes.

77% of HHs reported that they are aware of any grievance redressal mechanism w.r.t. HH tap water through PWS, but only 2% HHs have reported a complaint in the last year and only 2% of complaints have been resolved. Among those who reported complaints (i.e., 2% HHs, 24 HHs), 32% of the HHs reported their complaints to the pump operators besides other reporting channels.

Overall, 54% of villages in the UT levy charge for water service delivery to households whereas 48% HHs reported paying water service delivery charges at the households.

84% 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, 18% HHs reported using booster pumps to maximize the water flow through their piped water connections.

It was found that 31% of the villages have schemes that are based on groundwater sources, while 36% on surface water sources.

Age-wise functionality of the schemes indicates decline in ‘always functional’ schemes and there were no ‘non-functional scheme’ in the UT since 2012. 7%-point decline in a fully functional scheme was recorded from 2012 to 2013-18. In 2019 and later the same trend has maintained, however, 86% of schemes have been reported to be always functional and no scheme as partially functional.

Impact of JJM

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

Since having a functional HH tap connection, 29% HHs across the state have reported that there has been a change in the no. of employment days of the adult HH members while 67% HHs reported no change.

Out of the HHs reported (i.e., 1375) that female members used to fetch water before HH tap connection, 99% reported that post-installation of HH tap connection helped reduce of time and effort in collection of water.

Across the state, 100% HHs reported that since having a functional HH tap connection the attendance of the girls going to schools has increased.

1. State Factsheet

Functionality status of tap connection at households	India	A & N Islands
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	48
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	5	15
Inadequate quantity (<40 LPCD) (%)	10	37
Regularity[2] of water received by households		
Fully Regular Supply (as per schedule) (%)	80	85
Partially Regular Supply (not as per schedule) (%)	14	15
Irregular Supply (less than 9 months' supply) (%)	6	0
Potable[3] (Quality) water received by households (%)	87	90
Overall functionality[4] (%)	62	40

Service delivery parameters	India	A & N Islands
Overall user satisfaction on regularity at the household level (%)	83	87
Overall user satisfaction on quality at the household level (%)	82	88
Households receiving water supply daily-7 days a week (%)	74	3
Daily HH requirement of water being met by FHTC (%)	80	84
Households paying water service delivery charges (%)	35	48
Households aware of grievance redressal mechanism (%)	71	77
Households reported a reduction in time and effort in collecting water (%)	79	99
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	82
Residual Chlorine (RCL) detected with in permissible limits (%)	24	3
Villages with Field Test Kits (%)	30	23
Villages in which bacteriological test was done in last 1 year by VWSC/ Pani Samiti (%)	29	36
Villages reported to have a mechanism for chlorination (%)	21	35

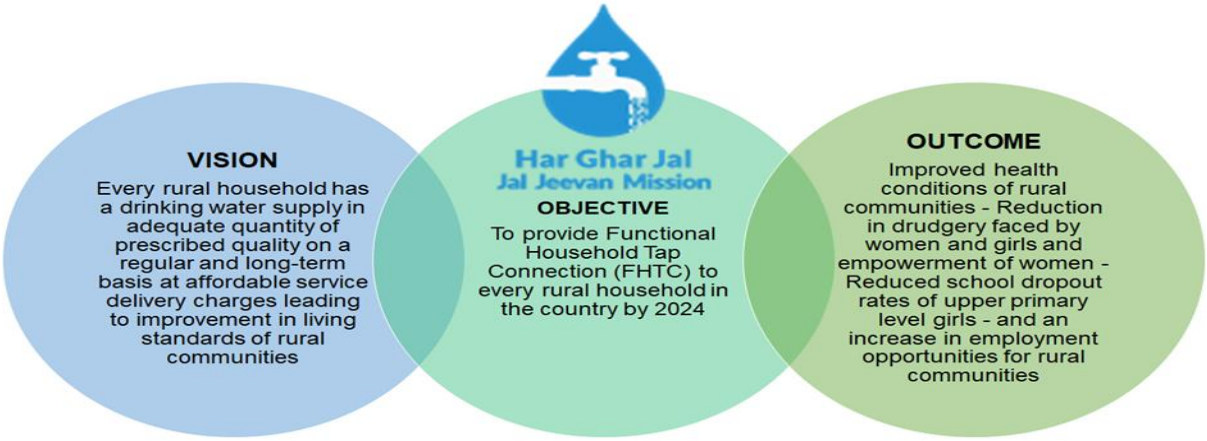
Institutional arrangement	India	A & N Islands
Village reported having presence of VWSC/ Pani Samiti (%)	38	5
Villages in which VWSC/ Pani Samiti is responsible for Operation & Maintenance of PWS schemes (%)	14	0
Villages in which persons are trained to use Field Test Kits (%)	31	19
Villages levying water service delivery to households (%)	34	54
Villages having skilled manpower for Operation & Maintenance of PWS schemes (%)	31	19
Community monitoring of water wastage in villages (%)	19	2
Villages in which signages about JJM were observed (%)	15	5

[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

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



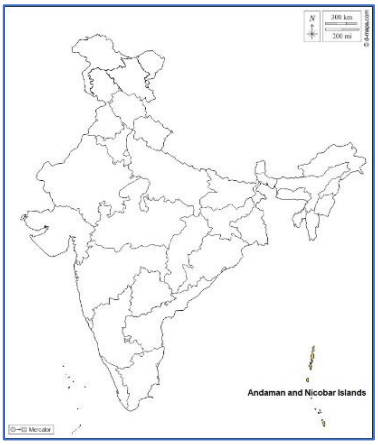
In accordance with the overall objectives as specified in the Operational Guidelines for the implementation of the NJJM, GoI carried out a sample survey to assess the functionality of household tap connections. As part of this endeavour, NJJM, GoI engaged HTA Kantar Public to conduct the 'Functionality 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: Andaman & Nicobar Islands

The UT of Andaman & Nicobar Islands lies on the south eastern part of India and has a population of 3,80,581 people. It has 3 districts and 266 villages where all the villages have PWS schemes. The UT lies on the Islands region and receives an average annual rainfall of about 2292mm. Among the villages with PWS schemes, 230 villages (86.47%) have more than 20 households with functional tap connections. The UT is yet to achieve the Har Ghar Jal status.

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

Figure 2: State IMIS Status & Map



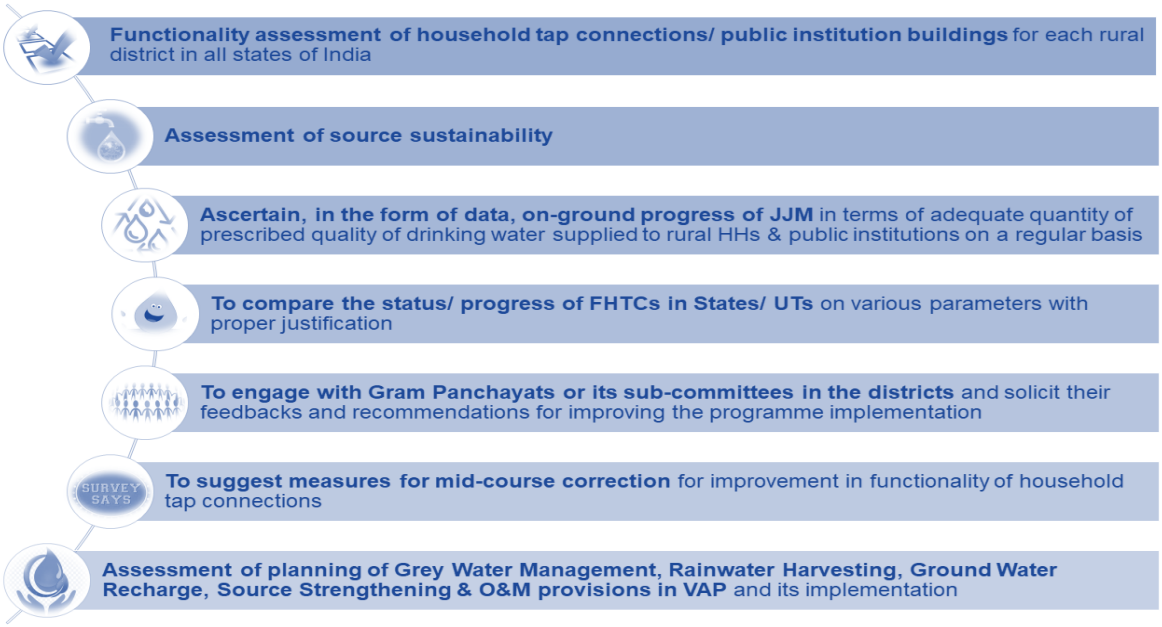
IMIS status:

- Not a Har Ghar Jal state.
- 1 district is Iron affected
- 230 (86.47% of all) villages with PWS more than 20 FHTC
- 100% villages covered under HH tap connections under HGJ

2.2. FHTC Assessment Objectives

The overall objectives of the FHTC assessment are as presented

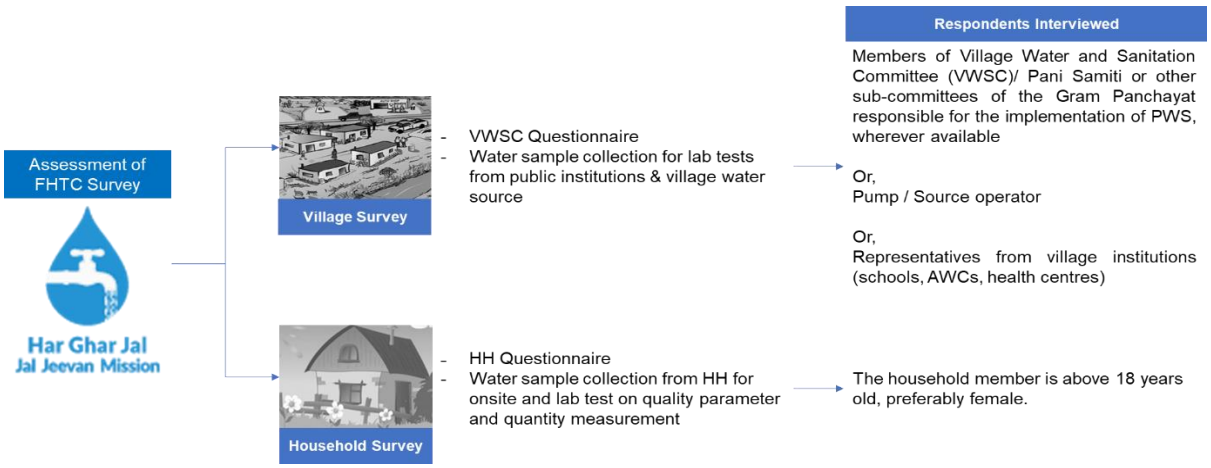
Figure 4: FHTC Assessment Objectives



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.

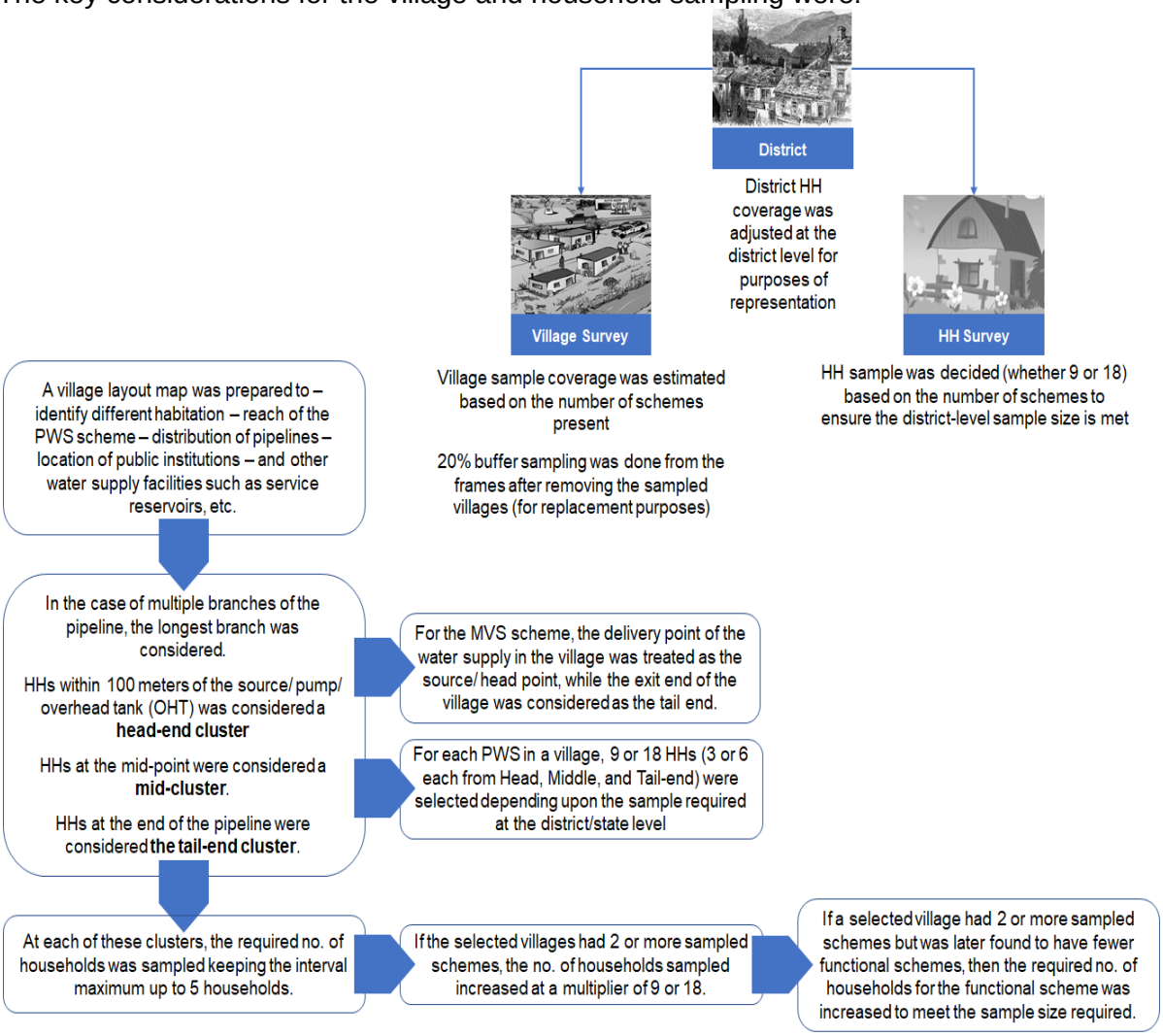
2.5. Sampling Methodology

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:

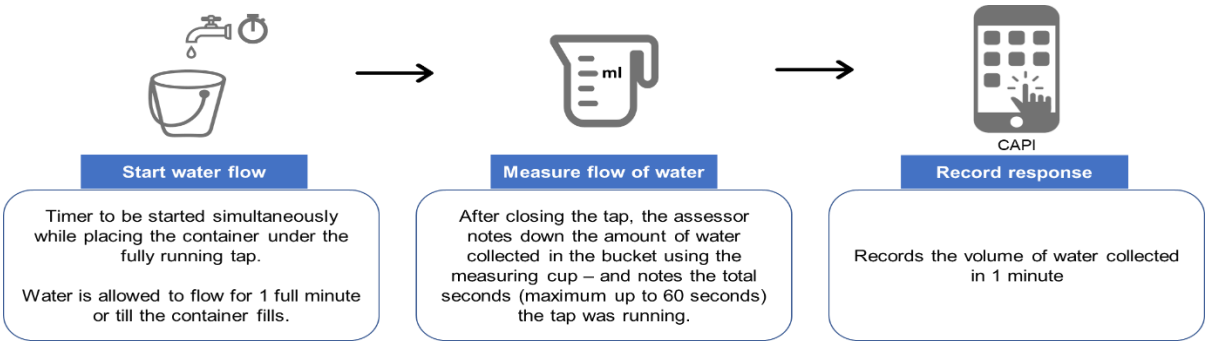


The record of all district-wise village replacements is maintained and reported as part of the annexure.

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:

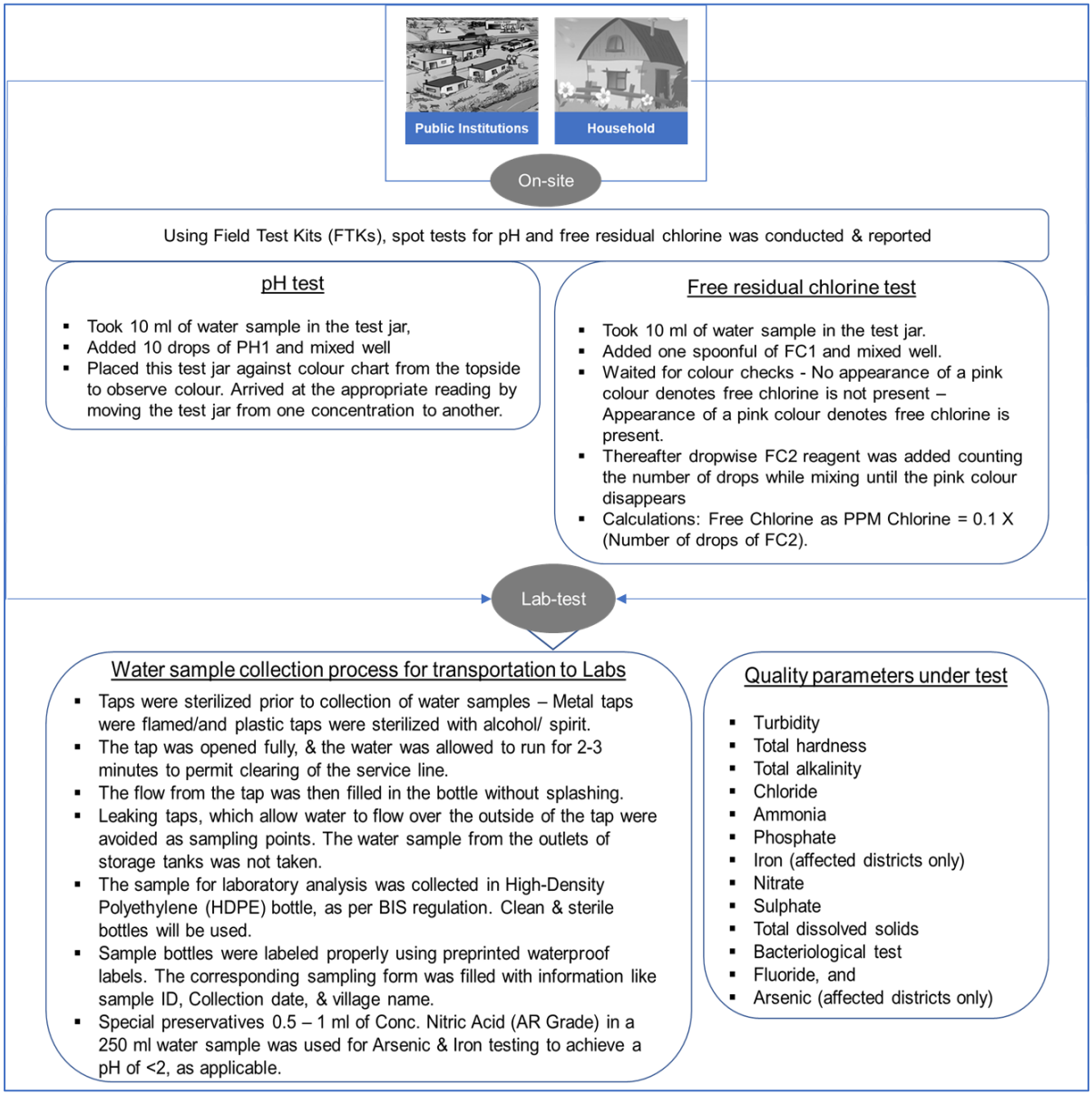
- Assessor first asked and recorded length, breadth, and height.
- Assessor dipped a 5 feet long rod, marked the level of the water table, and calculated the volume – length x breadth x-height of water.
- Next the assessor opened the valve of the connection and allowed the water to flow inside the storage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

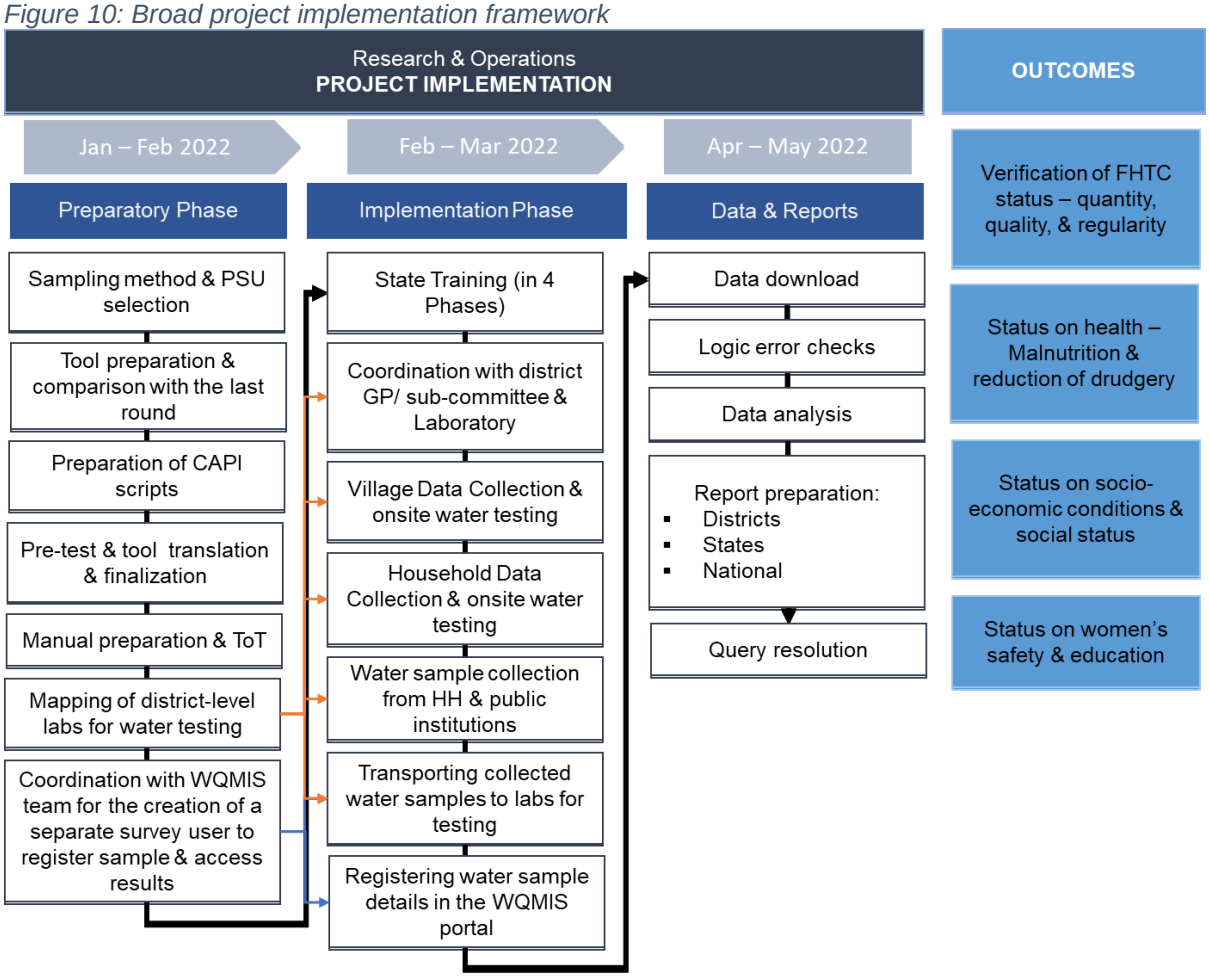


JJM, with the support of the BMI Division of ICMR, enabled a new interface on the WQMIS portal for “Functionality Assessment (FA) User” to enable seamless harmonization of water sample registration, and sample submission for testing, and sharing of results as per the applicable quality parameters.

2.8. Project Implementation

An overview of the project implementation is as presented:

Figure 10: Broad project implementation framework



A total of 2 teams (comprising 2 supervisors, 12 assessors, and 2 water collection assistants) were recruited, trained, and deployed to complete the survey across the states of Andaman & Nicobar Islands. 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
Andaman & Nicobar Islands	2 Teams	17th March	14th April	28 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**
Andaman & Nicobar Islands	**3**	**144**	**1,548**	**3**	**144**	**1,557**	**31**

2.10. Sampled village and household profile

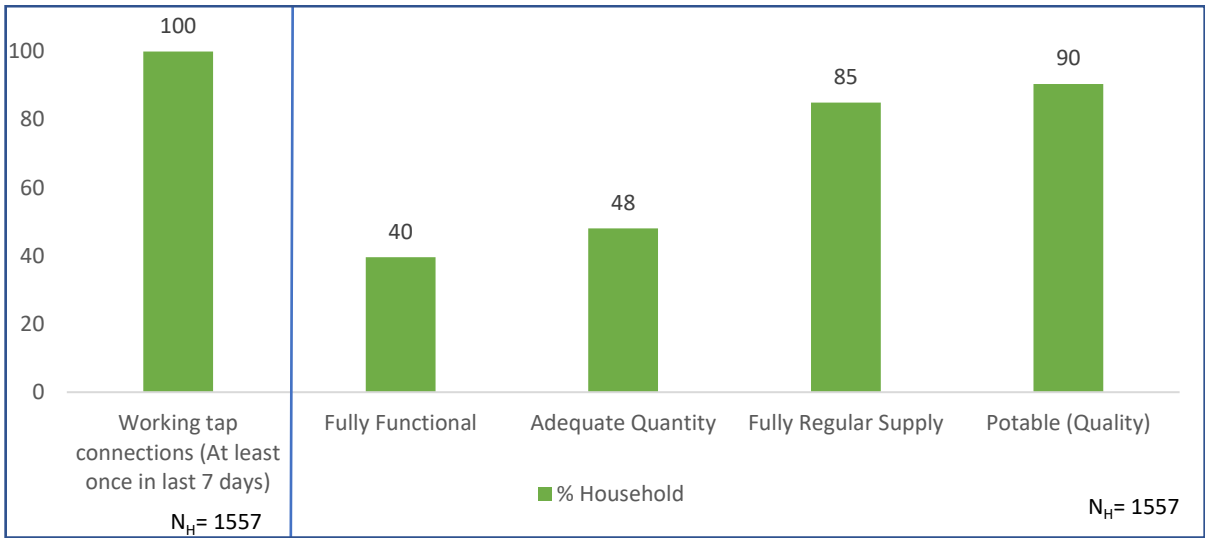
SAMPLED VILLAGES	SAMPLED HOUSEHOLDS
• Total no. of villages covered in the UT **– 144** • Percentage of SC dominated villages **– None** (while at national level the average is 12.6%) • Percentage of ST dominated villages **– 22.9%** (while at national level the average is **20.2%)** • Higher proportion of **pump operator** interviewed at the village level • **0.7%** of the villages reported to have any historical incidence of water contamination	• Total no. of households covered in the UT **– 1557 (Respondents: Male 710 & Female 847)** • Proportion of General – **65.1%**, SC **5.8%**, ST **6.8%**, OBC **22.3%** households • **54.4%** of the FHTC connections are under the name of a female member • Average household size **– 4.9** • **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 ∩ Fully Regular Supply ∩ Potable (Quality)*

Please note: Henceforth, N_H=1557 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=1557) had working tap connections. Moreover, more than 2 out of 5 households (48 percent) received adequate quantity (>=55 LPCD) water supply and more than 4 out of 5 received regular supply (85 percent) of water. The on-site testing and lab test results of the water indicates that more than four-fifth (90%) of the sampled households in the state receive potable water.

Out of the 1557 HHs sampled for the FHTC assessment, water was available in all households on the day of the survey.

Table No. 3: Quantity, Regularity, and Quality of FHTC at the district level (%HH)

S. No.	District	Working tap connections (HHs which received water through FHTC at least once in the last 7 days) (% HH)	Adequate Quantity (% HH)	Full Regular Supply (% HH)	Potable (Quality) (% HH)
1.	North and Middle Andaman	100	51	85	90
2.	South Andaman	100	36	76	85
3.	Nicobars	100	63	99	100
4.	**A & N Islands**	**100**	**48**	**85**	**90**

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 all districts reported functionality equal to the UT average. The districts of North and Middle Andaman and Nicobars FHTC provide more than 55 LPCD of water in more than 50 percent HHs.

More than 95 percent HHs in the district of Nicobars reported to regularly receive water through FHTC. Regular supply of water is less than 80 percent in the district of South Andaman.

Potability of water was found to be 85 percent in the district of South Andaman. Whereas in the district of Nicobars the potability of water was found to be 100 percent.

B. District wise functionality status

Figure 12: District wise Functionality of HH tap connection

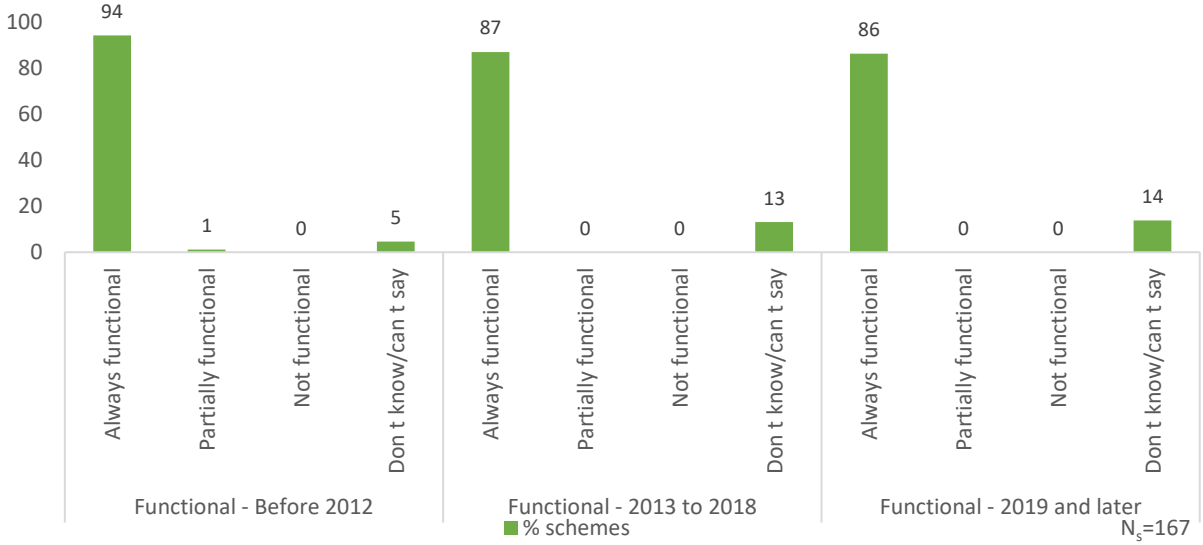
** 'Functionality' has been computed as the intersection of Adequate Quantity, Fully Regular Supply and Potable (Quality) for households wherein water supply was available at the time of survey, i.e., 1557 HHs.*

40 percent HHs in the UT were found to have functional HH tap water connection. Nicobars district reported 62 percent functional households in the UT, followed by North and Middle Andaman with more than 40 percent functionality. In the district of South Andaman, one-fourth (25 percent) of the households have functional HH tap water connection highlighting scope for improved service delivery.

C. Age vs functionality of schemes in the villages

More than 9 out 10 schemes were functional before 2012 and more than 8 out of 10 were functional from 2013-18 which reflects a 7-point decline and similar trend was observed from 2019 and later reflecting 1 percent decline.

Figure 13: Age vs functionality of schemes in the villages



3.2. Quantity, Regularity, and Quality of Water

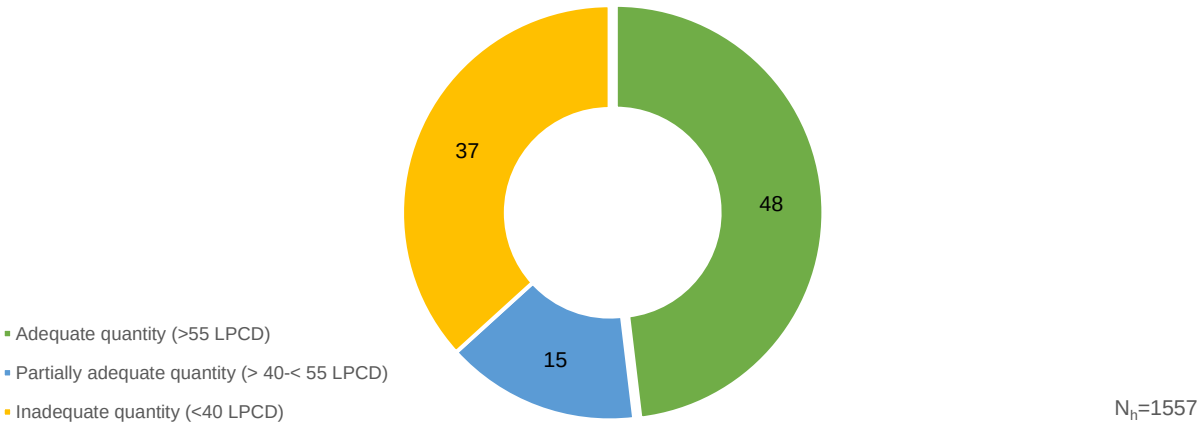
Under JJM, functionality is defined as having infrastructure, i.e., household tap connection providing water in adequate quantity (55 LPCD or more) of prescribed quality on regular basis

(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)

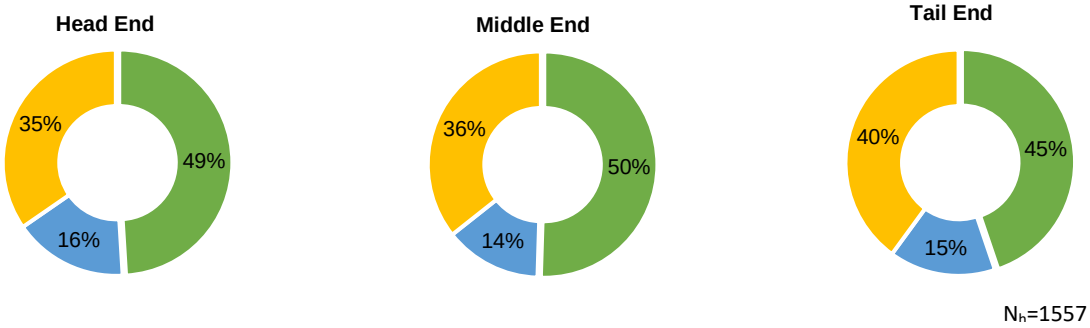
48% HHs reported receiving adequate quantity of water (more than 55 LPCD of water)

Figure 14: Quantity of water received by households



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

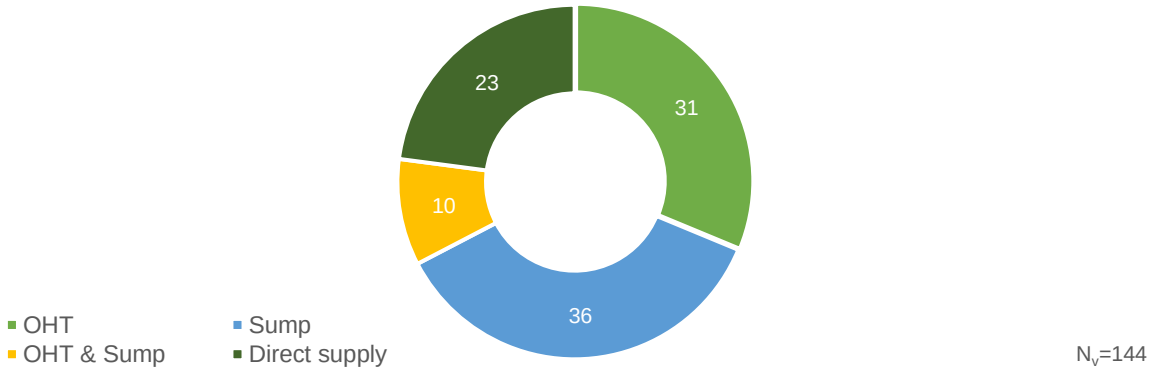
Figure 15: Quantity of water received across head, middle and tail end households



The quantity of water received across the head, middle, and the tail end was observed to have increased in the middle end and declines in tail end, and less than half (48%) of the sampled households received water in adequate quantity, i.e., greater than or equal to 55 LPCD.

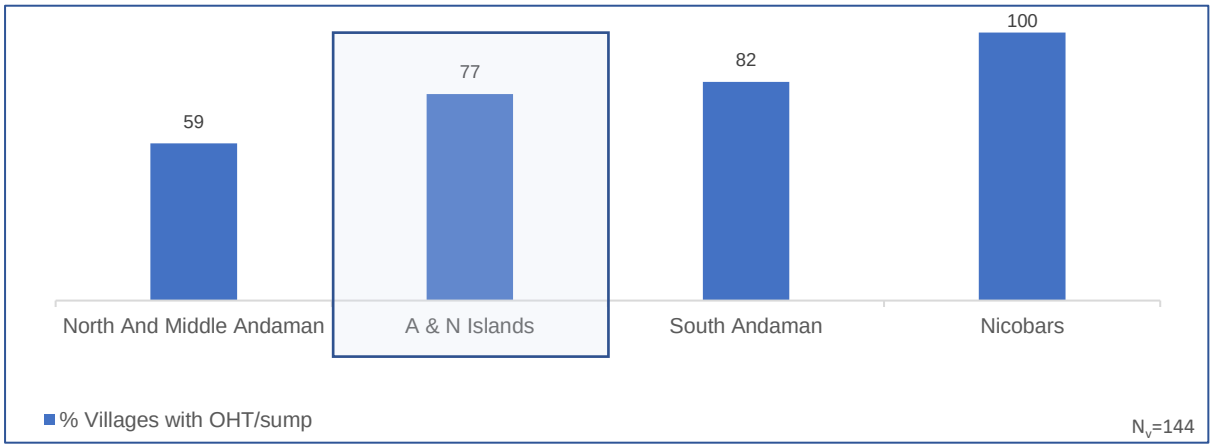
Types of water storage arrangements at village level (in %)

Figure 16: Pipe water supply storage available in village



Less than one out of four (23 percent) respondents in the UT reported water being directly supplied. And in 77 percent reported water being stored in sump and overhead tanks.

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

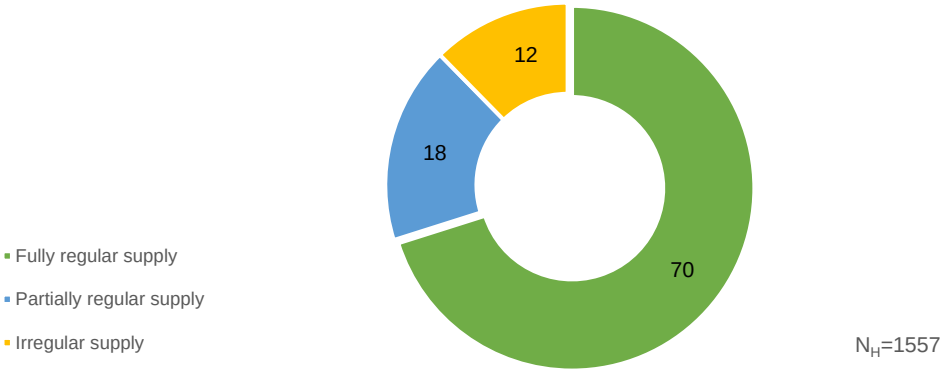


77 percent villages in the UT have either an OHT or a sump for storing water for supplying to the households. Nicobars is the only district where all the villages have either an OHT or a sump, followed South Andaman where more than three-fourth of the villages have facilities to store water for supplying to the households.

B. Regularity of water supply to households

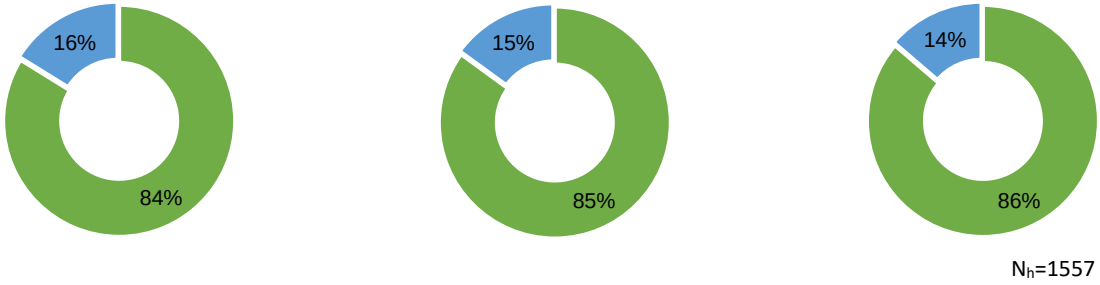
85% HHs receive a regular supply of water (as per agreed schedule)

Figure 18: Regularity of water received by households



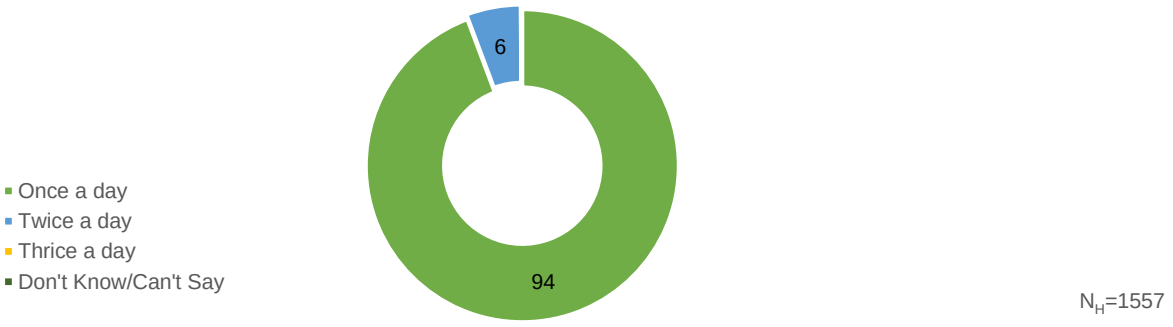
Regularity of water received across head, mid, and tail end

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



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

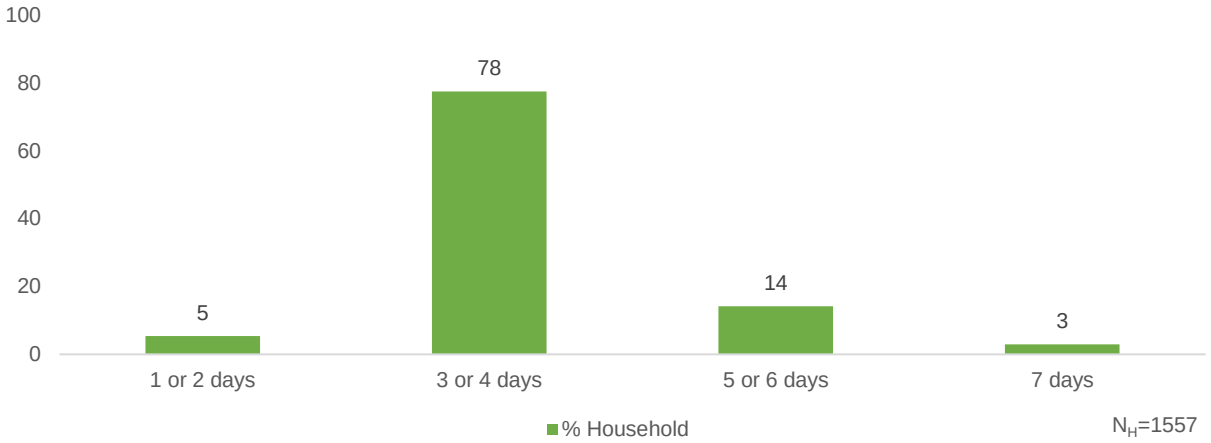
Figure 20: Average no. of times water is supplied in a day



HHs in **94 percent of districts** receive water once a day. The average duration of water supply across the UT was reported to be **1 hours per day**

Average water supply days in a week to households

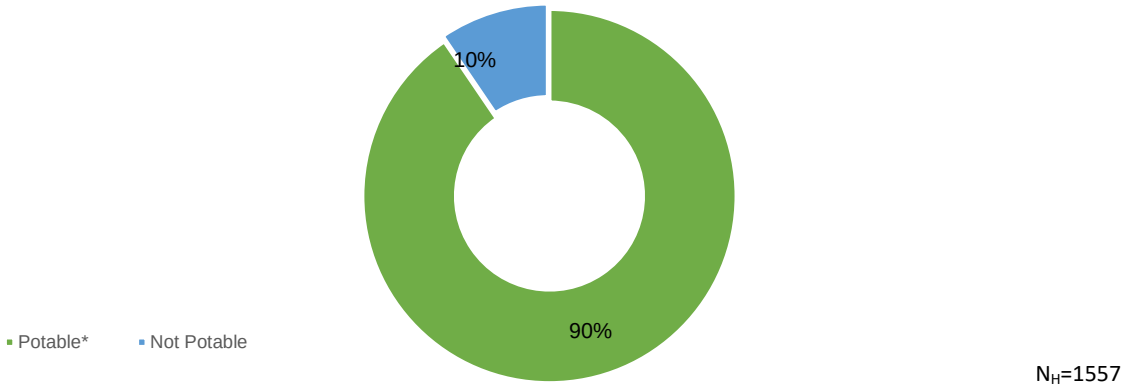
Figure 21: Average number of days households receive water supply in a week (in %)



78 percent of HHs receive water only three or four days in a week.

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 Andaman and Nicobar Islands where water was found on the day of the survey, the potability of water was found to be 90%.

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

Quality Parameters (N_v=144)	Water Samples Tested from Public Institutes			
	Anganwadi Centre	Health Facility	Schools	Others
pH (on-site)	100		100	
Turbidity	100		100	
Total Hardness	100		100	
Total Alkalinity	100		100	
Chloride	100		100	
Ammonia	100			
Iron	Not Tested			
Nitrate	100		100	
Sulphate	100		100	
Total Dissolved Solids	100		100	
Bacteriological Test (Absence)				
Fluoride	No History			
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=1557). 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)	1557	99
Turbidity	836	88
Total Hardness	846	100
Total Alkalinity	846	100
Chloride	844	100
Ammonia	333	98
Iron	355	100
Nitrate	453	100
Sulphate	844	100
Total Dissolved Solids	844	100
Bacteriological Test (Absence)	165	78
Fluoride	No History	
Arsenic	No History	

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

The Residual Chlorine (RC) in the Union Territory of Andaman and Nicobar Islands was found in 3% samples. No sample was found which had RC outside range whereas 97% samples, had no RC. 78% of water samples passed the bacteriological contamination test. While in 22% samples bacteriological contamination is found, out of which no sample had chlorine in permissible range while in 100% samples there was no chlorination, and no sample was outside 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:

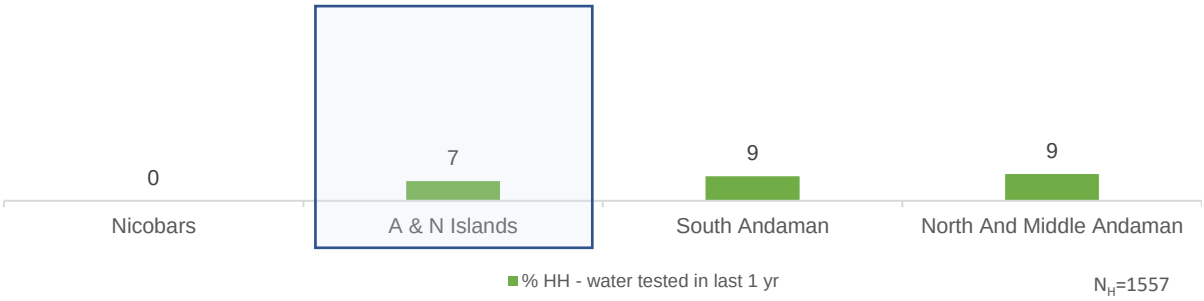
The district lab tested water samples for 11 water quality parameters. 1588 water samples were submitted, and 852 water samples were tested, and reports made available. The turnaround time for testing was more than 48 hours in most cases. Given this feedback, it can be conferred that these labs have 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	North And Middle Andaman	Yes	595	609	303	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resources, reagents, etc. However, the only concern was the lab did not accept any samples during weekends and public holidays.
2	South Andaman	Yes	593	610	549	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resources, reagents, etc. However, the only concern was the lab did not accept any samples during weekends and public holidays.
3	Nicobars	Yes	369	369	0	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resources, reagents, etc. However, the only concern was the lab did not accept any samples during weekends and public holidays.

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

7% of HHs reported that their HH tap-water was collected and tested in the last one year

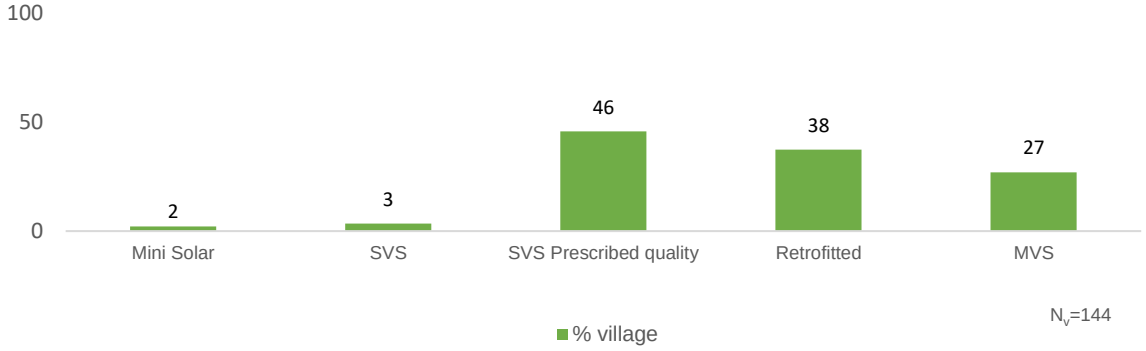


3.3. Operation and Maintenance (O&M) of schemes at village level

Schemes reported to have faced challenge in village

The SVS Prescribed quality scheme faced the most challenges (46%) in comparison to the other schemes in the UT.

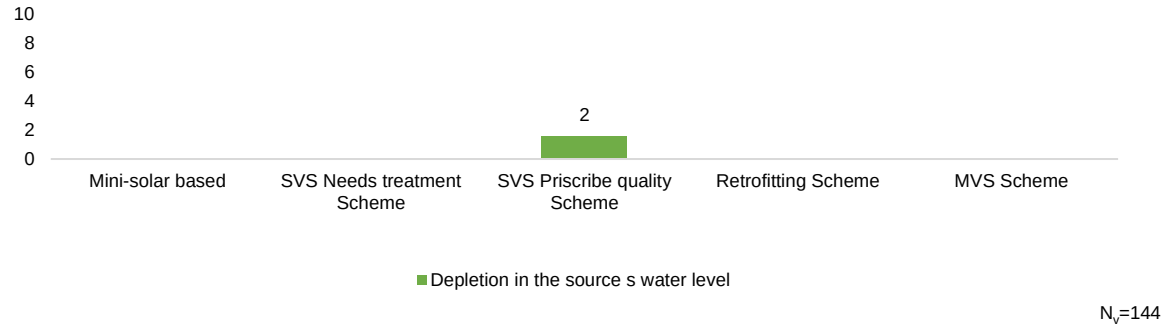
Figure 23: Schemes reported to have faced challenge in village



Type of challenge faced by the schemes

The SVS prescribed quality scheme faced most problems and depletion in the sources water level was found to be a problem in the scheme

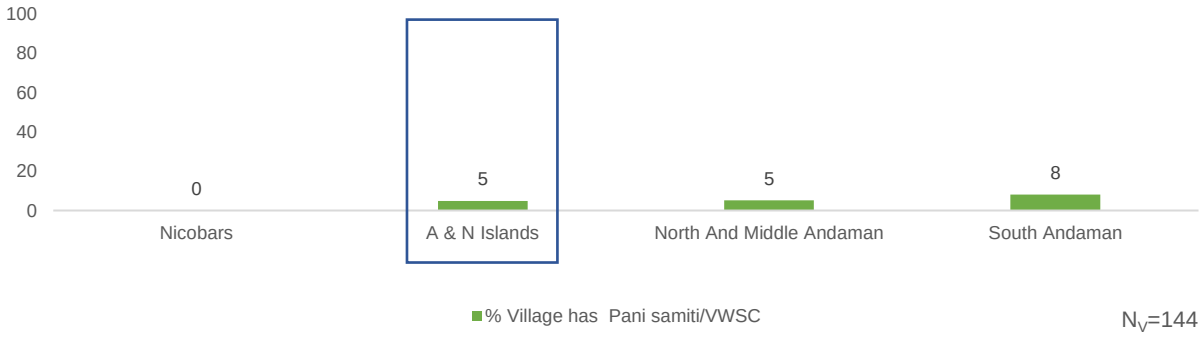
Figure 24: Type of challenge faced by the schemes



A. Presence of VWSC/Pani Samiti

5% of villages in the UT reported to have a VWSC or a Pani Samiti.

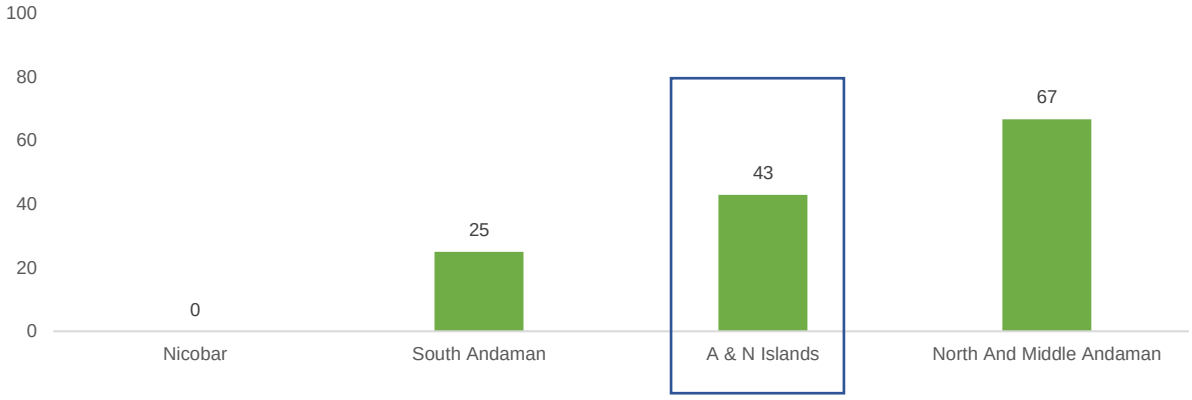
Figure 24: Villages where VWSC/ Pani Samiti is present



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

43 percent of the VWSC/Pani Samitis in Andaman and Nicobar Islands were having more than 50 percent female members.

Figure 25: VWSC/ Pani Samiti with more than 50 percent female members

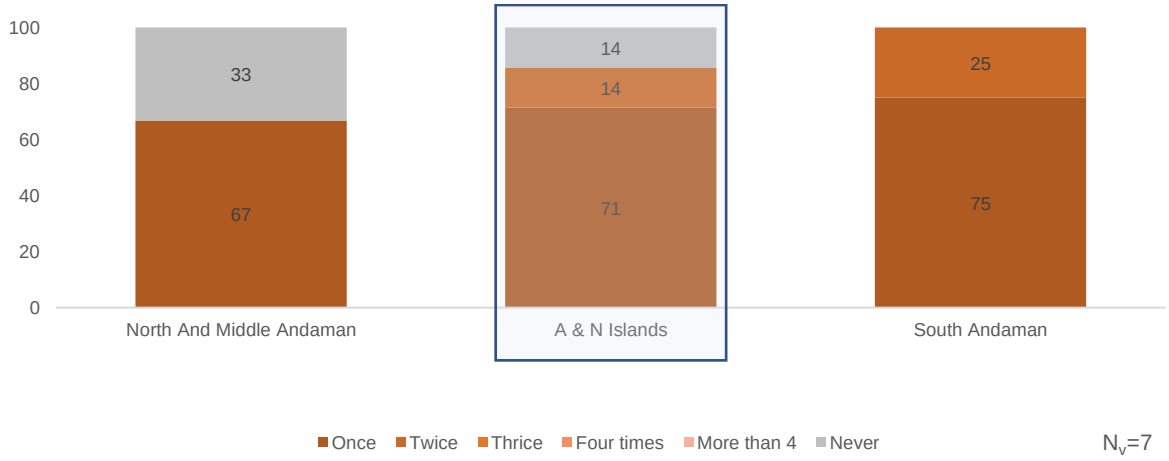


N_V(All Villages in which VWSC is present)= 07

C. VWSC Meetings in last one year

Across the villages in the UT, that reported to have VWSC/Pani Samitis (7 villages), one meeting in last one year was reported the most (71%)

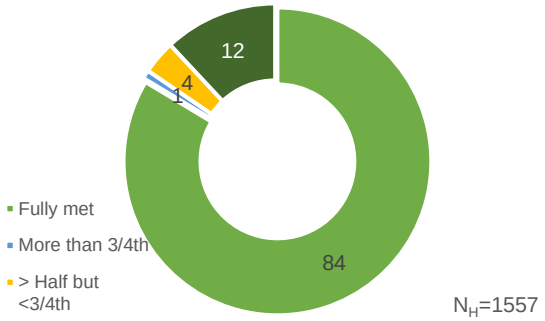
Figure 26: VWSC meetings held in last one year



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

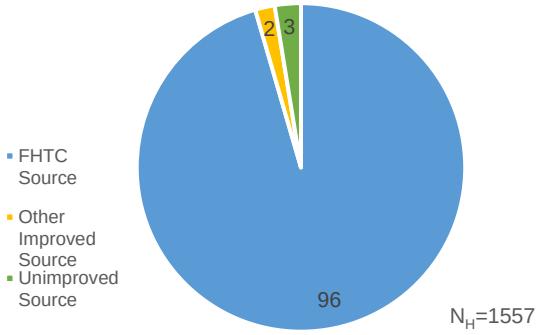
84% of HHs reported that their daily requirement of water was being met by HH tap connections

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



96% HHs reported HH tap connections as their primary source of drinking water

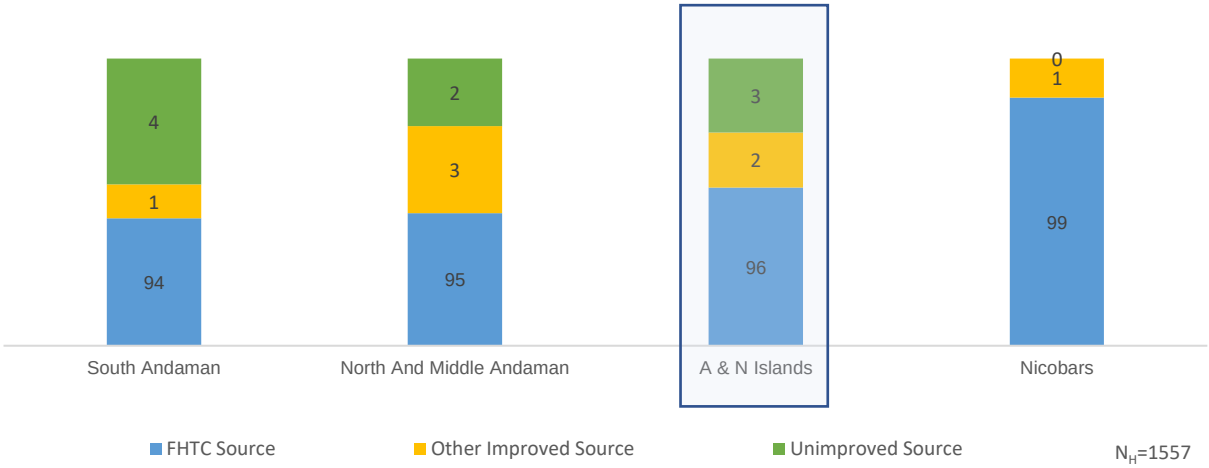
Figure 27: Households reported FHTC as primary source of drinking water



More than 4 out of 5 (84%) HHs reported their daily requirement of water being fully met by the HH tap connections. And 96 percent HHs reported used household tap connection for drinking water (primary source). About 2 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.

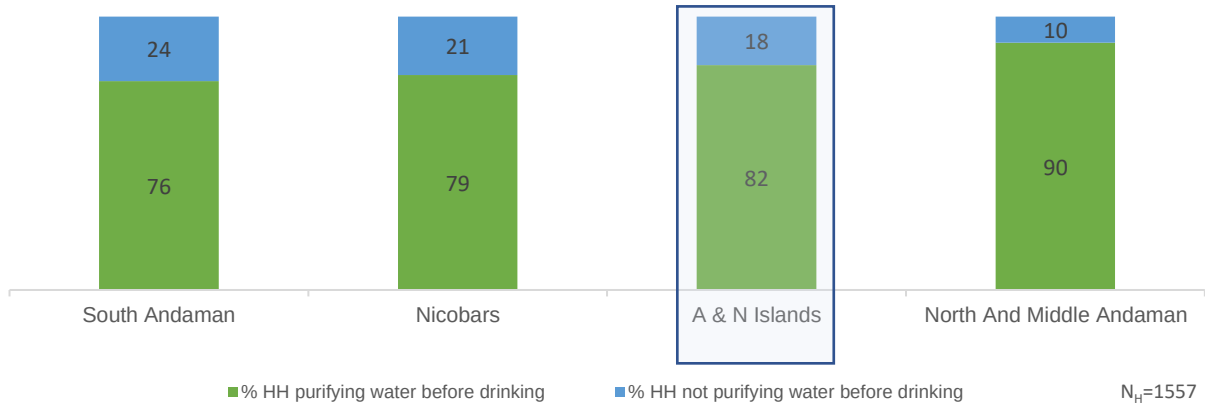
Overall, **98% of HHs** reported using improved primary source of drinking water, out of which **96% of HHs** reported HH tap water as their primary source.

Figure 29: District wise distribution of household's reported FHTC as primary source of drinking water



A. Households who practice of purifying water before drinking

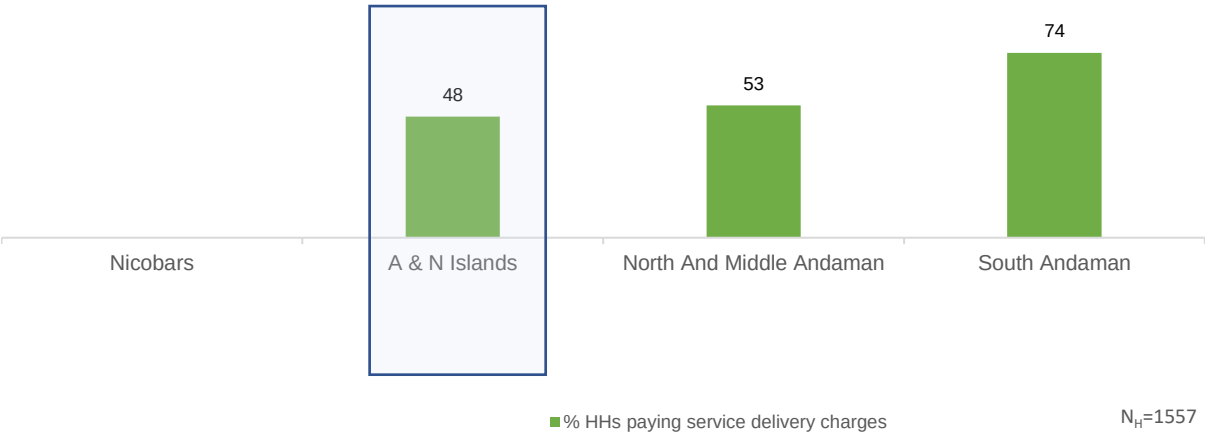
Figure 30: Households who practice of purifying water before drinking



Practice of purifying water before drinking was reported the most in North and Middle Andamans (90%) where 95 percent HHs reported using HH tap water as primary drinking water source, while the least was reported in South Andamans (76 percent) where 94 percent HHs reported using HH tap water as a primary drinking water source.

B. Households paying water service delivery charges

Figure 32: Households paying water service delivery charges

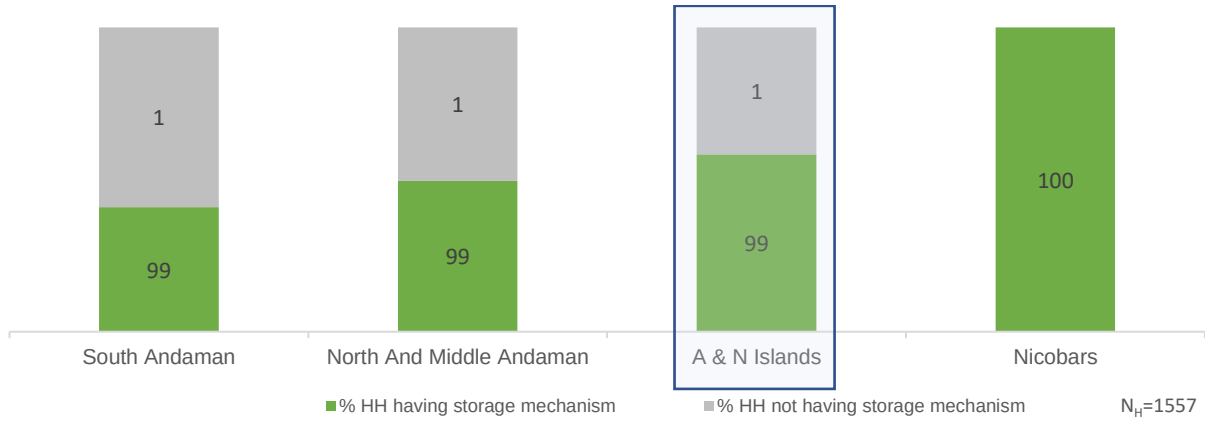


In Andaman and Nicobar Islands, around 48% of the sampled households were found to be paying service delivery charges, South Andaman being the district with the highest percentage of such households (74%) and Nicobars being the district in which households reported not paying any water service delivery charges.

C. Storage mechanism used by households

Overall, 99% households in Andaman and Nicobar Islands were found to use some mechanism to store water in the household.

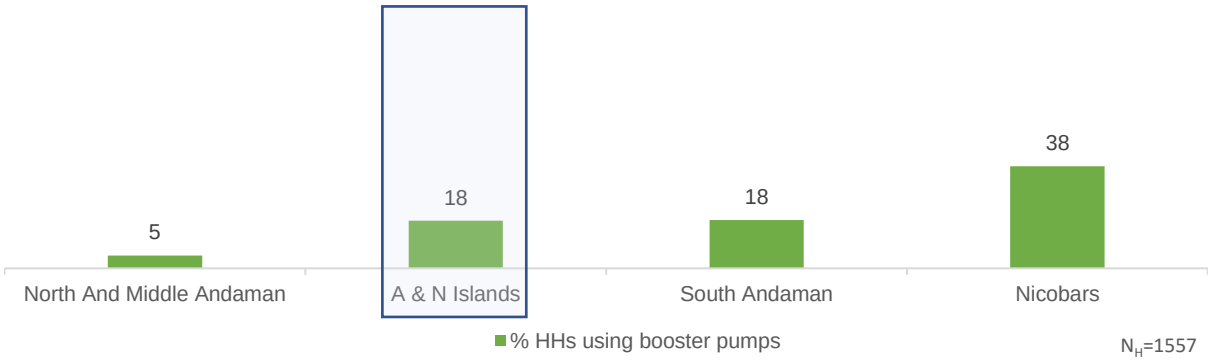
Figure 31: Households reported using some storage mechanism



D. Households using booster pumps

Overall, **18% HHs** reported using booster pumps to maximize the water flow through their piped water connections. Nicobars reported 38 percent of HHs using booster pump in the UT while North and Middle Andaman reported only 5%

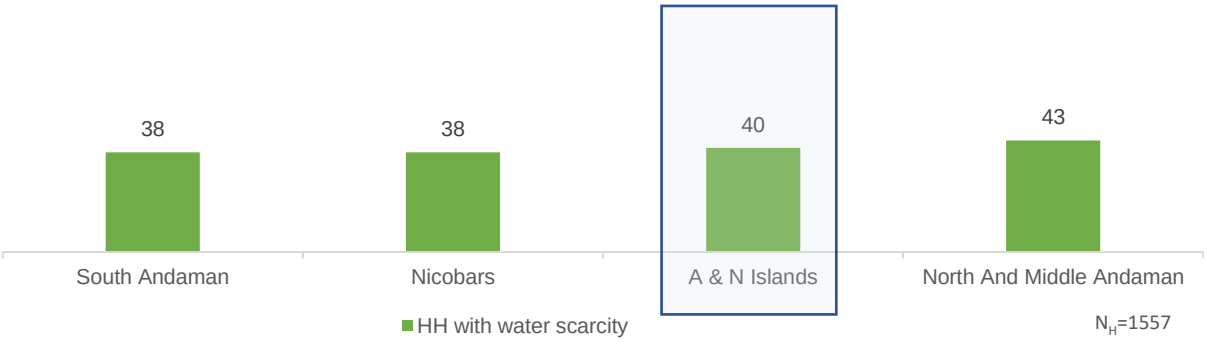
Figure 32: Households reported to use of booster pumps



E. Households who faced shortage of water

In the UT, **40% HHs** faced shortage of water during any time of the year.

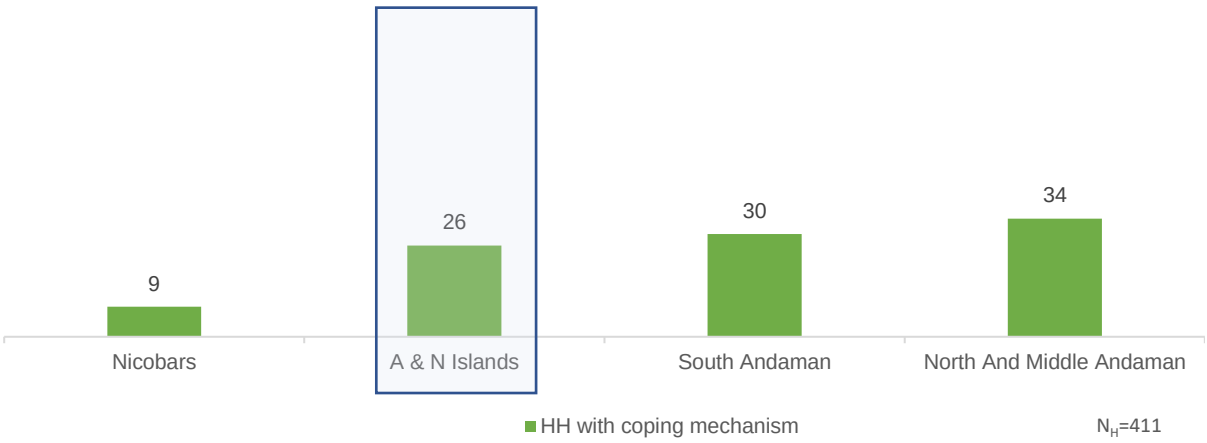
Figure 33:Households who faced water scarcity



F. Household with a mechanism

26% HHs reported having some mechanism to cope with scarcity of water.

Figure 34: Households reported to have some mechanism to cope with scarcity of water

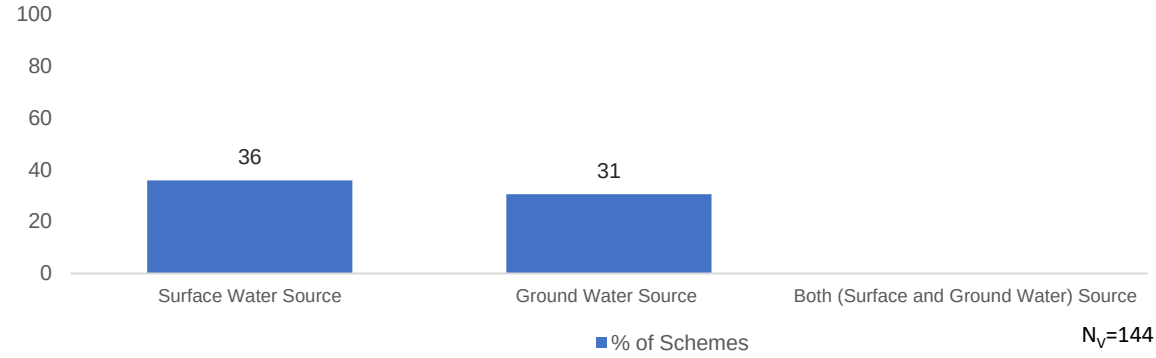


3.5. Source sustainability at the village level

Schemes based on surface and ground water

36% of schemes reported to be based on surface water source while 31% of schemes were reported to be based of ground water sources.

Figure 35: Schemes based on water source in village

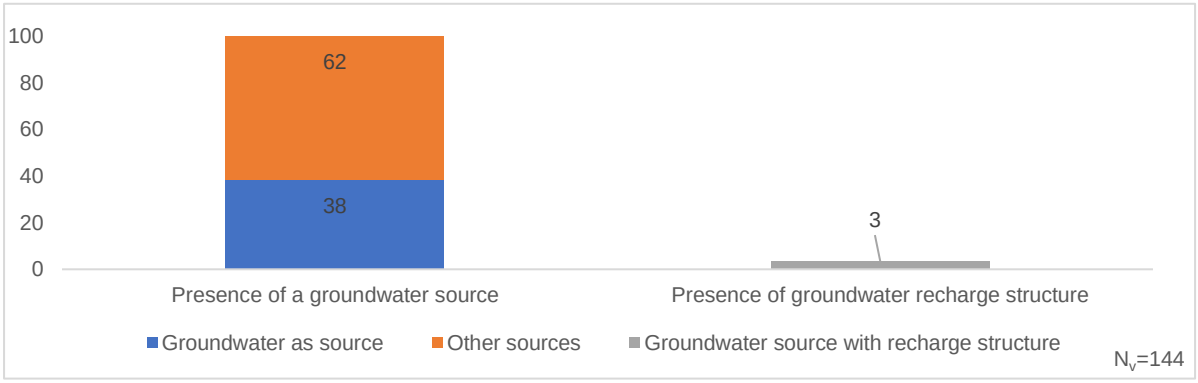


**'Surface Water Source' is Stream, Spring, Glacier, River, lake, pond etc. and Groundwater Source is open well, borewell, tube well, handpump, spring, etc.*

Villages reported having presence of a groundwater source

In the UT, **38 percent villages** reported the presence of groundwater sources like improved dug wells and borewells. Out of which, 3 percent of villages reported (i.e., 5 villages) reported having a recharge structure.

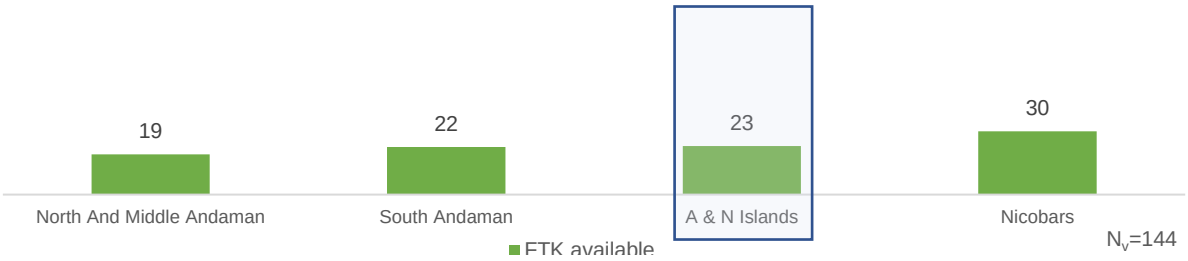
Figure 36: Villages reported the presence of groundwater sources and among those how many reported to have a recharge structure



3.6. Water quality monitoring and surveillance in the villages

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

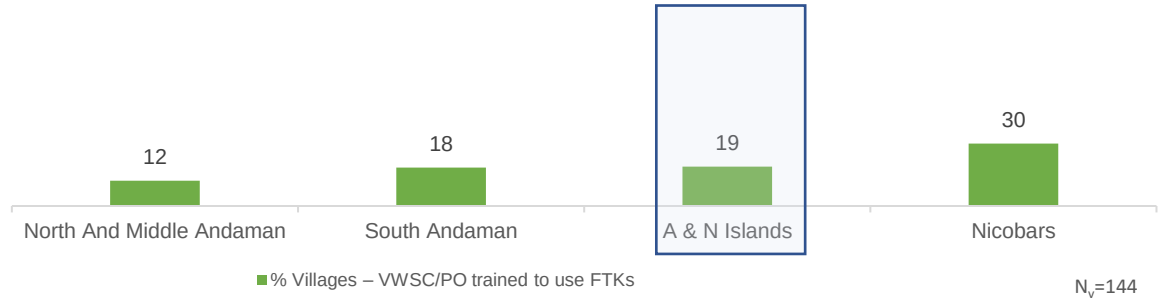
Figure 37: Availability of field test kits with VWSC/ Pani Samiti



With regards to water quality testing in the village by VWSC, 23 percent villages in the UT reported having available field test kits. Nicobars reported 30 percent villages having available field test kits for water quality testing, while North and Middle Andaman reported only 19%.

B. Persons trained to use field test kits in villages

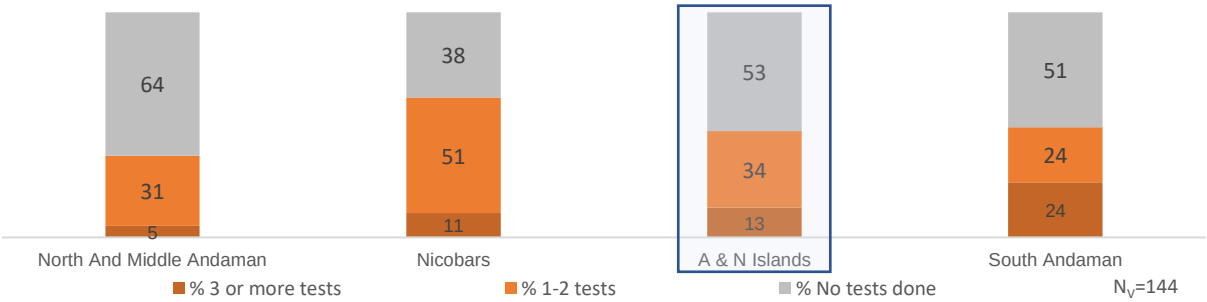
Figure 38: Persons trained to use field test kits



Overall, **19 percent of villages** in the UT reported to have either VWSC/Pani Samiti or pump operator trained to use field test kits for testing the quality of water on-site. Nicobars reported 30 percent VWSC/Pani Samiti or pump operator trained to use field test kits while North and Middle Andaman reported 12 percent.

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

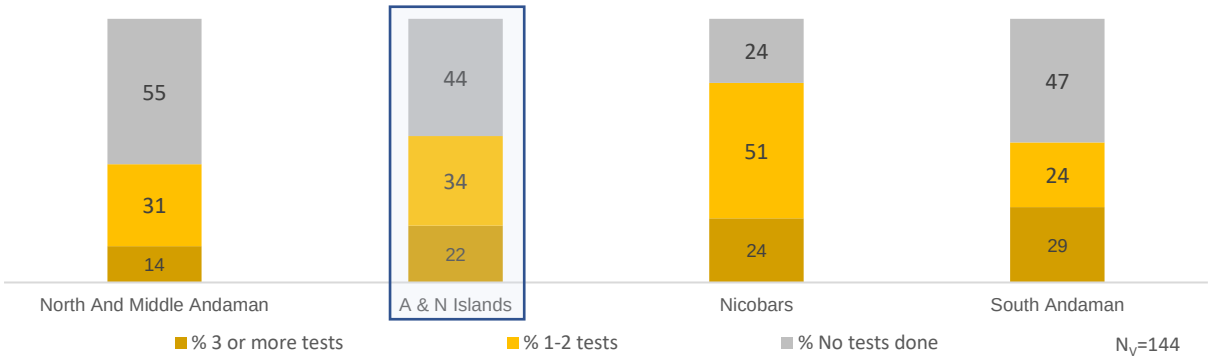
Figure 39: Frequency of testing using FTK in villages



Across the UT, less than 2 out of 10 total sampled villages (13 percent) 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, South Andamans had the highest proportion of such villages, wherein 24 percent of its villages reported using FTKs three or more times in last one year.

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

Figure 40: Frequency of lab testing

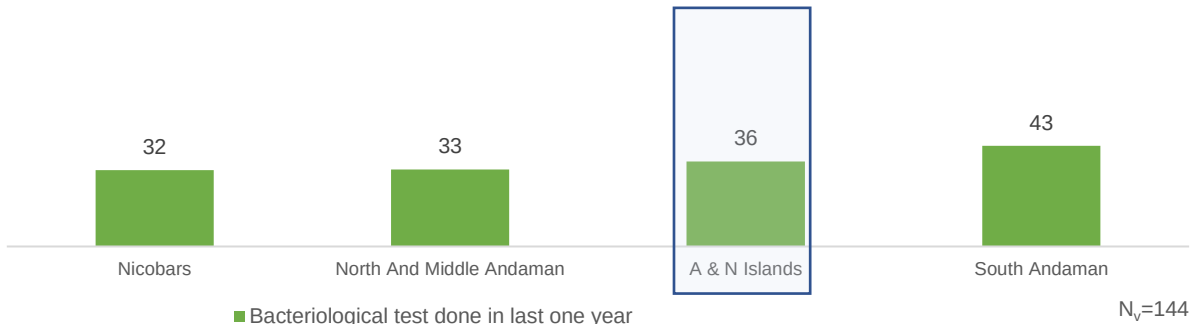


Across the UT, less than one-fourth of the total sampled villages (22 percent) reported that the quality of water (at different points in the respective villages) was checked at least three times through laboratories in last one year. Among the districts, South Andamans had the highest proportion of such villages, wherein 29 percent of its villages reported tests through laboratories - three or more times in last one year.

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

With regards to water quality testing in the village by VWSC, **36 percent villages** in the UT reported having bacteriological test done in the last one year.

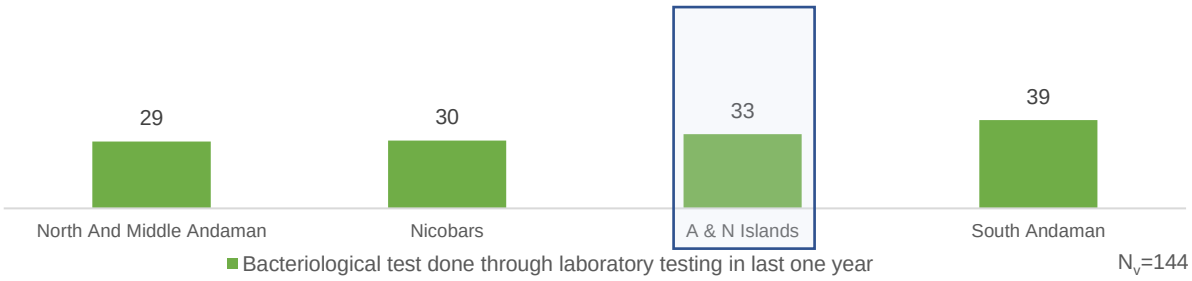
Figure 41: Percent villages in which Bacteriological test was done in the last one year



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 33 percent of sampled villages. Almost two-fifth (39 percent) of sampled villages from the districts South Andamans reported to have had bacteriological tests done through laboratories in last one year.

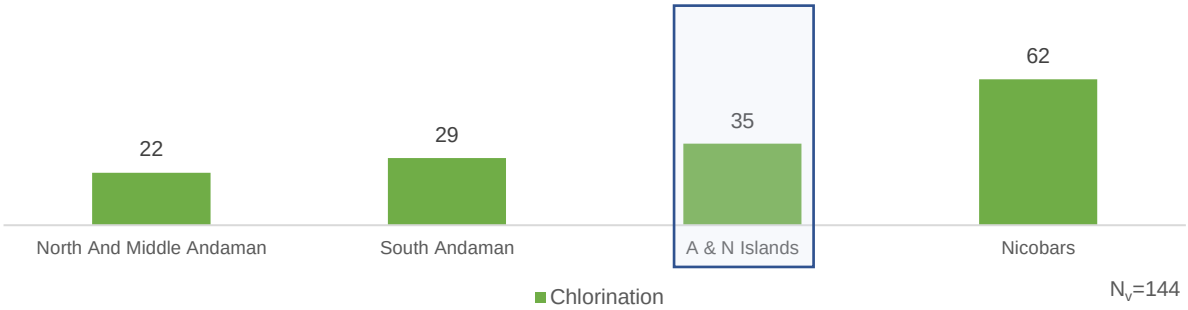
Figure 42: Bacteriological test done through laboratory testing in the last one year



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

More than **one-third (35 percent) villages** reported that there is availability of chlorination mechanism in the village but during onsite testing of water at household level only 3% households tested to have for presence of chlorine.

Figure 43: Villages having a mechanism for chlorination



3.7. Management of water service delivery at village level

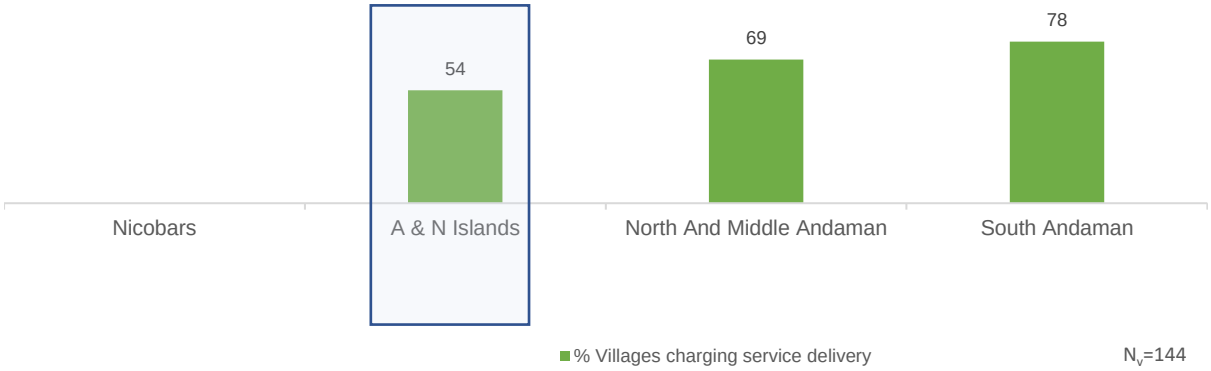
A. VWSC/Pani Samiti responsibility for O&M of PWS schemes

In the UT, **no villages** that have VWSC/Pani Samiti reported to be responsible for operation and maintenance of PWS.

B. Villages levying water service delivery charges from households

Overall, **54% of villages** in the state levy charge for water service delivery to households whereas **48% HHs** reported paying water service delivery charges at the households.

Figure 44: Villages levying water service delivery charges from households



C. Convergence of JJM activities with other schemes in villages

In the UT, **no villages** in the UT reported convergence of activities under JJM with other government programmes/ schemes on skill development, capacity building and training, and awareness generation.

D. Villages where signages

Signages about JJM were observed in 5 percent of the sampled villages. District South Andaman had the highest proportion of villages where signages were observed (10 percent).

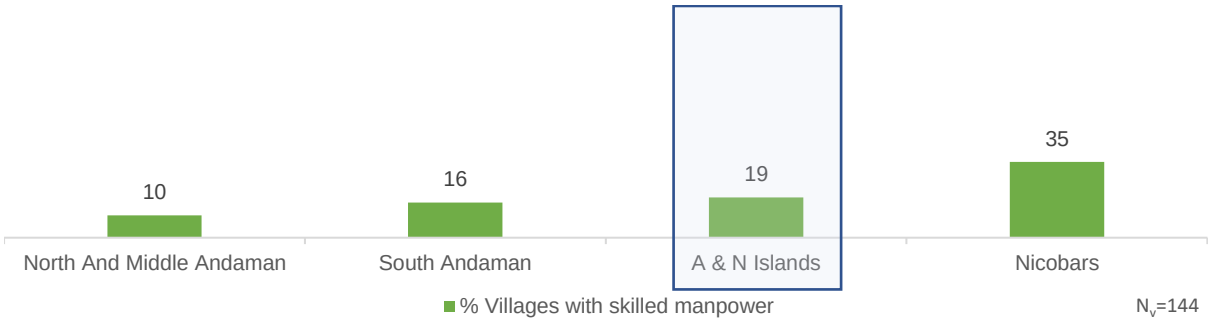
Figure 45: Villages in which signages about JJM was observed

3.8. Status of Operation & Maintenance

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

Across the UT, **19 percent villages** in the reported having identified skilled manpower for O&M of PWS schemes, the most was reported to be in Nicobars (35 percent) and the least in North and Middle Andaman (10 percent)

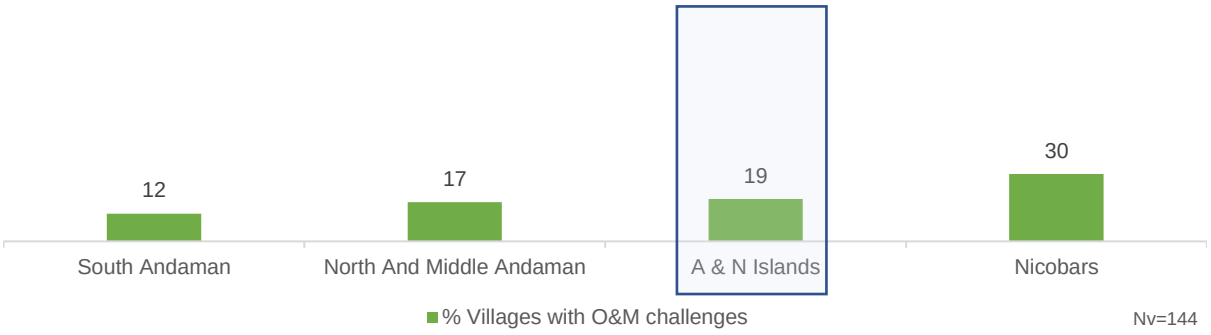
Figure 46: Villages reported having skilled manpower for O&M of PWS schemes



B. Villages with O&M challenges

In the UT, **19 percent of villages** in the UT reported to have faced challenges with respect to O&M of PWS schemes

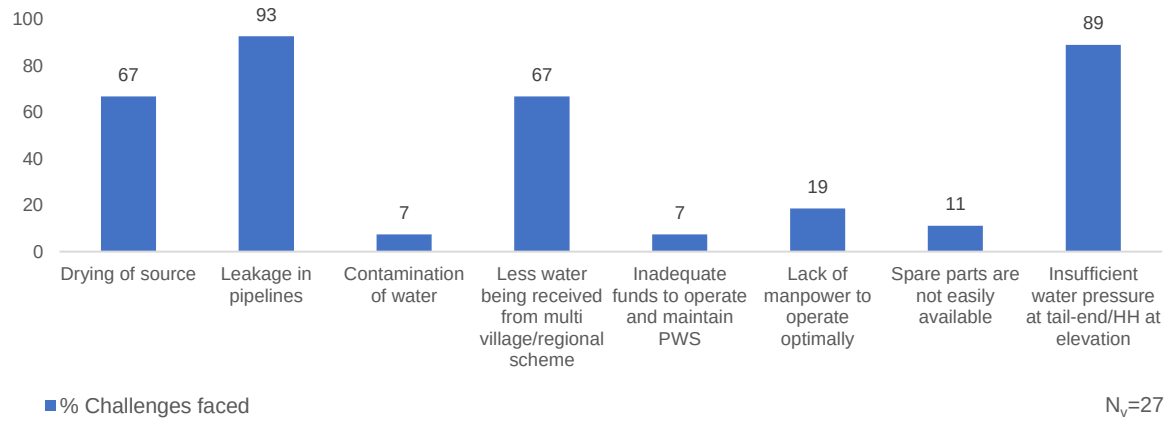
Figure 47: Villages reported having faced O&M challenge



C. Details of challenges faced

Out of the 19 percent of villages that had faced challenges with respect to O&M of PWS schemes (27 villages), 'leakage in pipelines' was attributed the most – at 93 percent.

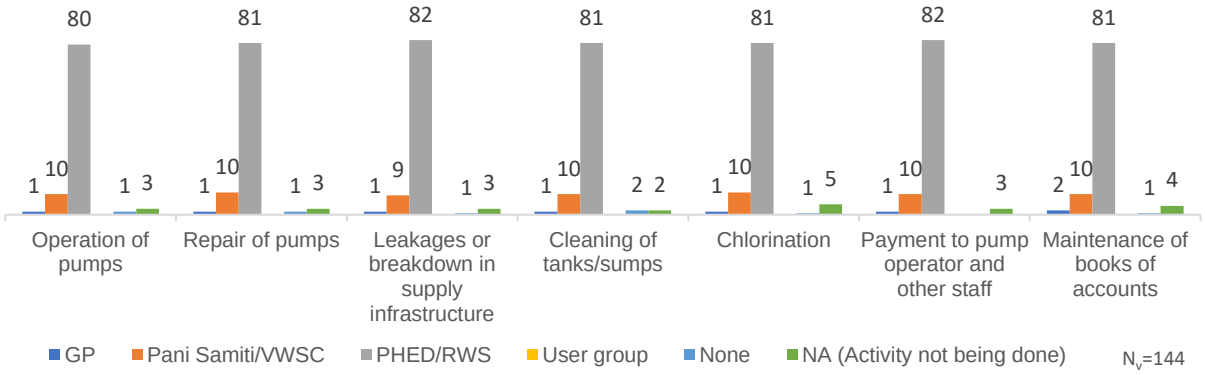
Figure 48: Details of O&M challenges faced by village



D. Responsible for O&M

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

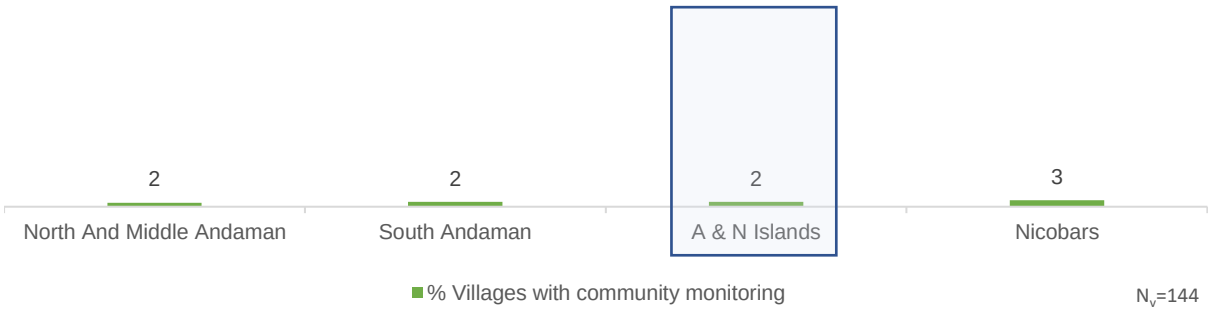
Figure 49:Responsibility of O&M in villages



E. Villages with community level monitoring of water wastage

2 percent of villages in the UT reported to have community level monitoring of water wastage

Figure 50: Villages reported having community level monitoring of water wastage

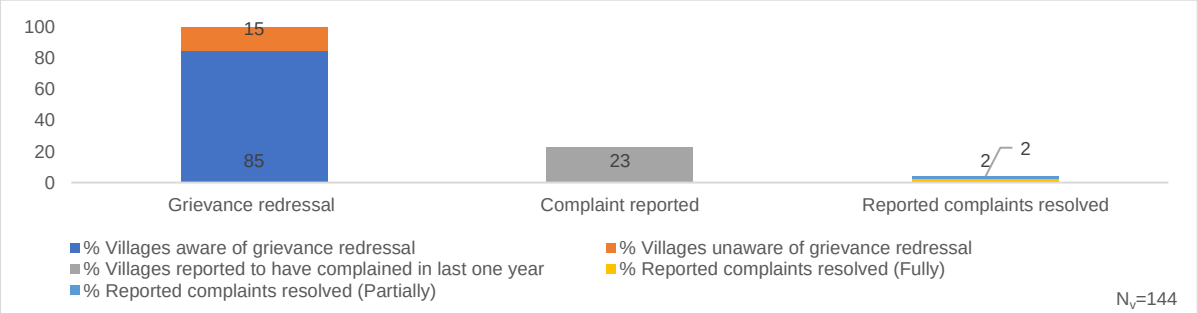


3.9. Status of service delivery related grievances and redressal

A. Village level

Grievance redressal at village

Figure 51: Reporting of grievance redressal at village level

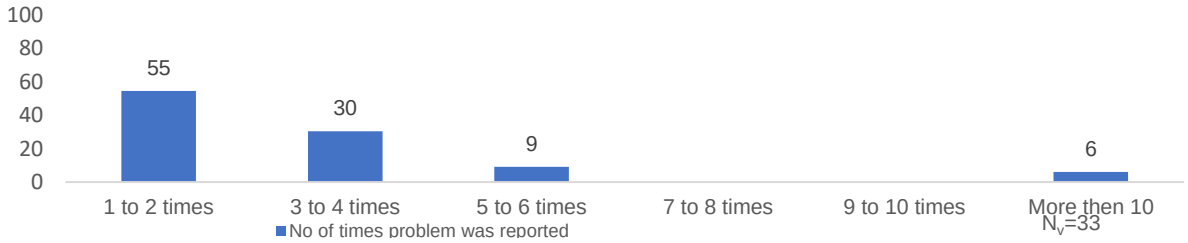


In the UT, **85 percent of villages** reported that they are aware of any grievance redressal mechanism, but only 23 percent HHs have reported a complaint in the last one year amongst which 2 percent reported that the complaints are fully resolved while 2 percent of complaints have been partially resolved.

Problem reported in last 1 year

Among the villages who reported a complaint (i.e., 33 villages), 55 percent villages have reported a complaint more than 1 to 2 times in the last one year, while 30 percent reported a complaint at least three or four times.

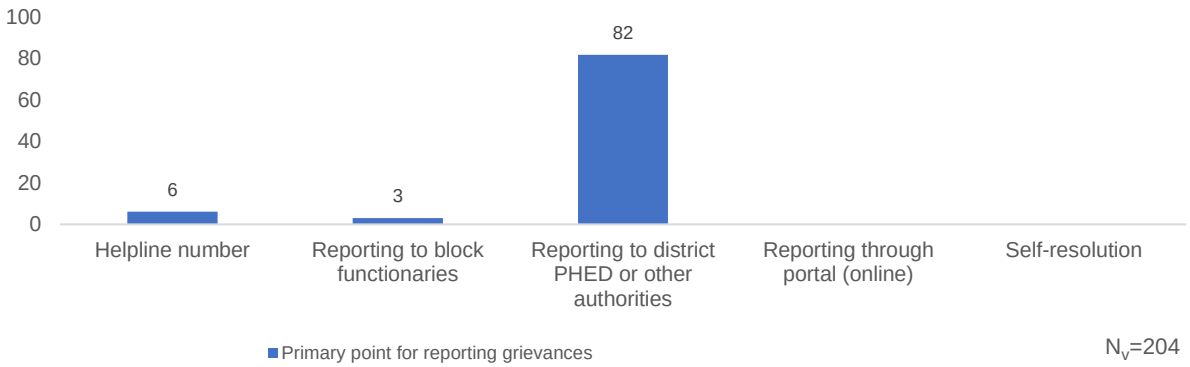
Figure 52: Number of times villages have reported grievance in last 1 year



Primary points for reporting grievances

Among those who reported complaint (i.e., 23% HHs, 33 villages), **82% of villages** reported that they report their grievances to **district PHED** beside other reporting-points.

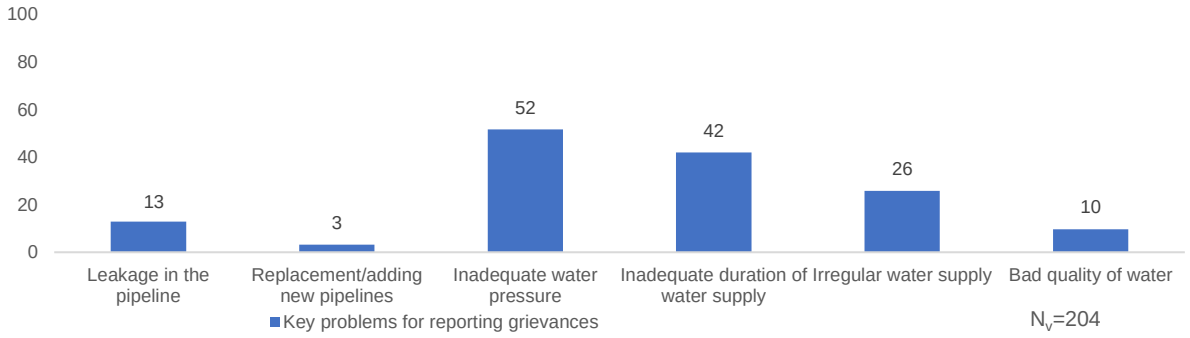
Figure 53: Primary points for reporting grievances by village



Key problems for reporting grievances

Overall, among those who reported complaint (i.e., 23% HHs, 33 villages) **52% of villages** reported that **inadequate water pressure** is their most encountered problem for reporting grievances

Figure 54: Key problems reported by village

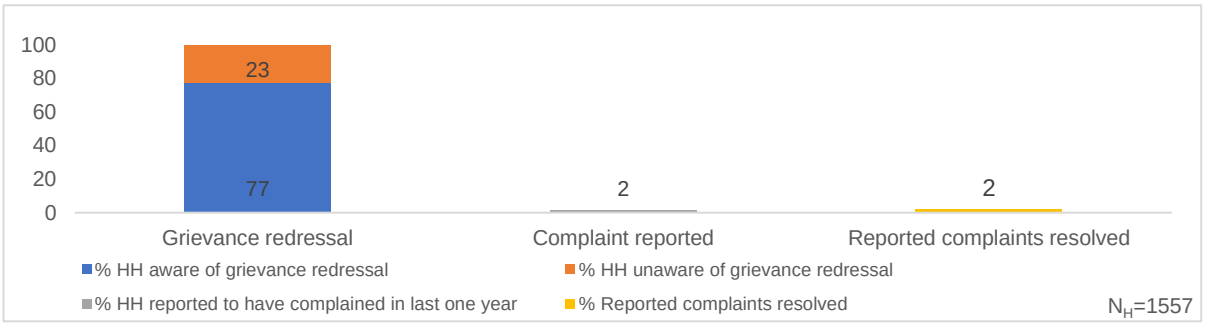


B. Household level

Awareness of grievance redressal at household

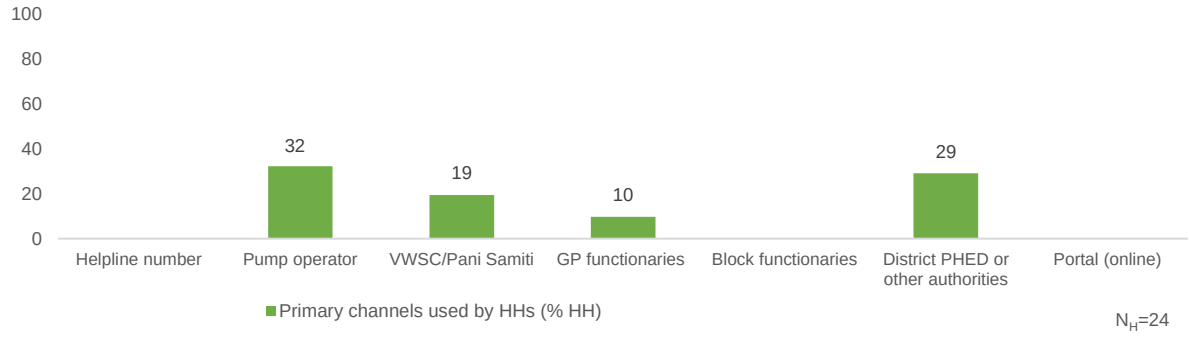
In the UT, **77 percent of HHs** reported that they are aware of any grievance redressal mechanism w.r.t. HH tap water through PWS, but only 2 percent HHs have reported a complaint in the last one year and only 2 percent of complaints have been resolved.

Figure 55: Reporting of grievance redressal at household level



Primary channels for reporting grievances by households

Figure 56: Primary channels for reporting grievances by households

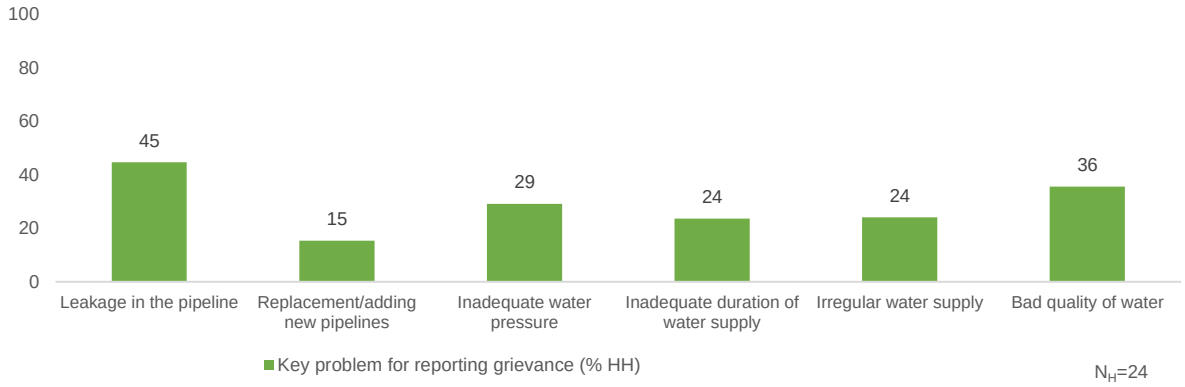


Among those who reported complaint as shown in the above graph (i.e., 2% HHs, 24 HHs), **32%** of the HHs reported their complaints to the **pump operators** beside other reporting-channels

Key problems for reporting grievances

Overall, among those who reported complaint (i.e., 2% HHs, 24 HHs) **52%** of the HHs that reported problems was of **inadequate water pressure** beside other problems.

Figure 57: Key problems reported by households

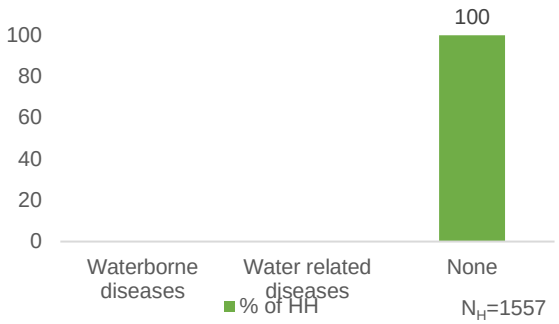


3.10. Perception of HHs on Outcome Indicators

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

Across the state no 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

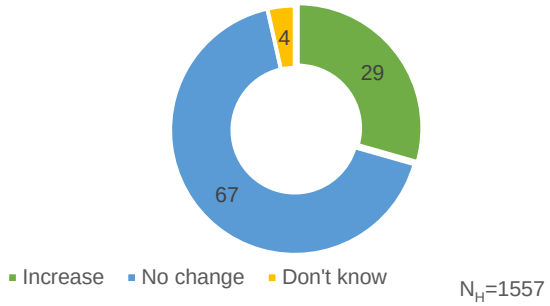
Figure 58: Household reported incidence of water borne diseases in last one year



B. Change in employment days since FHTC programmes/schemes

Since having a functional HH tap connection, 29% HHs across the state has reported that there has been a change in the no. of employment days of the adult HH members while 67% HHs reported no change

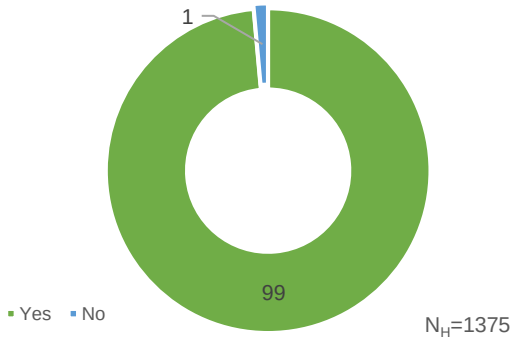
Figure 59: Household reported a change in employment days since FHTC programmes /schemes



C. Reduction in time and effort in collecting water

Out of the HHs reported (i.e., 1375) that female members used to fetch water before HH tap connection, 99% reported that post installation of HH tap connection it helped reduction of time and effort in collection of water

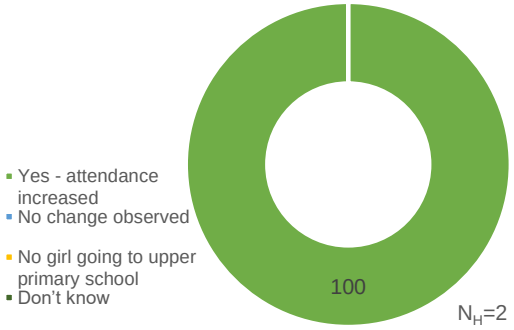
Figure 61: Households reported reduction in time and effort in collecting water



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

Across the state, 100% HHs reported that since having a functional HH tap connection the attendance of the girls going to schools increased.

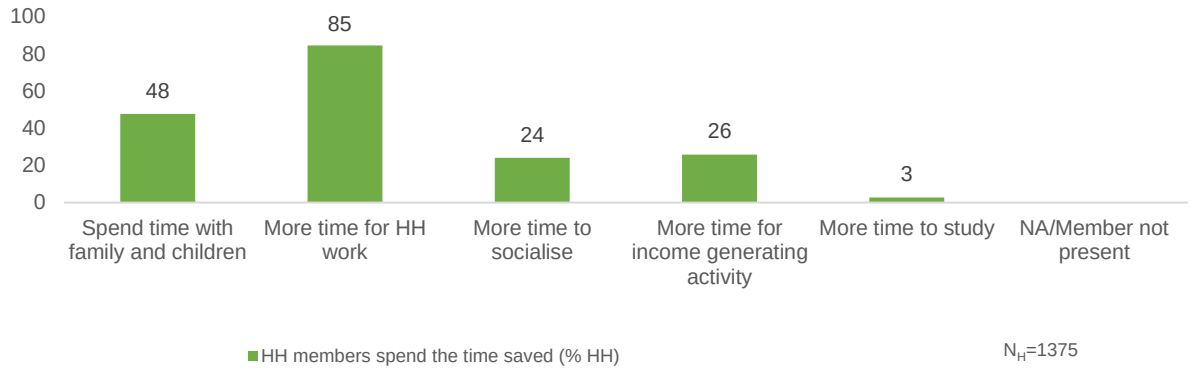
Figure 60: Households reported increase of attendance of girls going to upper primary school



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 (85 percent).

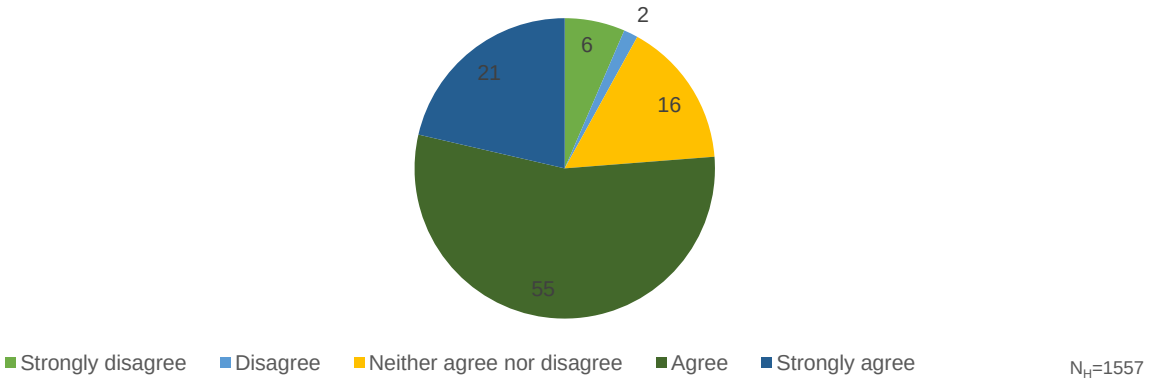
Figure 62: Utilization of time saved by household's post installation of HH tap connection



F. Change in social status

Sense of pride and positive change in social status was reportedly realized by 76 percent of HHs post the installation of HH tap connections.

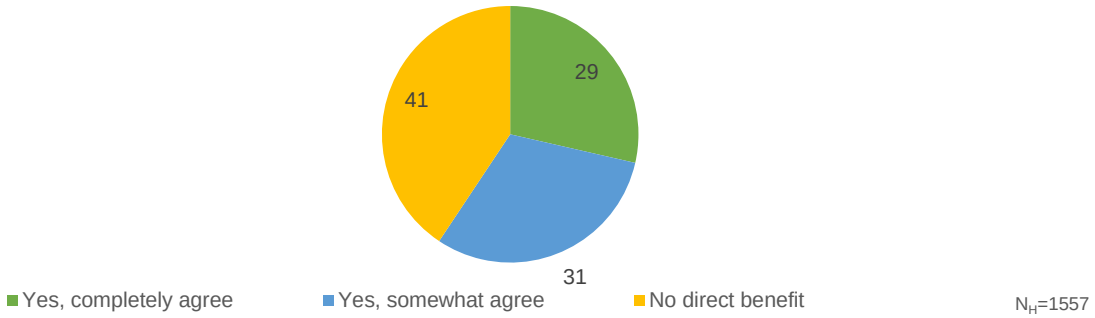
Figure 63: Households reported to have a positive change in social status



G. Direct benefits in terms of income due to FHTC

Across the UT, 29 percent 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 31 percent HHs reported being in partial agreement against the same.

Figure 64: 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=1557)**		**In %**
1	Regularity		87.0
2	Overall quality		88.1
3	Colour		90.6
4	Taste		90.7
5	Odour		90.0

Note:
Base (N_v)=144 means all villages sampled and covered in UT of Andaman and Nicobar Islands.
Base (N_H)=1557 means all households sampled and covered across the 144 villages in UT of Andaman and Nicobar Islands.
Base (N_H)=1557 means all households sampled where water sample be collected across the 144 villages in UT of Andaman and Nicobar Islands
Base (N_H)=1375 means all households sampled where female members used to fetch water before HH tap connection
Base (N_H)=2 means all households sampled that had adolescent girls as one of HH members

4. Annexure

No sampled village replacement was made in the state.