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

Har Ghar Jal
Jal Jeevan Mission

STATE REPORT: ODISHA

SURVEY DURATION: FEBRUARY 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 state of Odisha lies in the eastern part of India and has a population of 4,19,74,218 people (Census 2011). It has 30 districts and 47412 villages, and 23150 villages have PWS schemes. The state is yet to achieve the Har Ghar Jal status. A total of 505 villages, across all districts, and 11652 households were randomly sampled for the survey, and additionally, water samples from 266 public institutions were tested.

In the assessment among sampled villages, 84% of villages have only one scheme, 14% of villages have 2-3 schemes, and 2% of villages have 4 and more schemes. Mostly all schemes across the state were found functional.

At the state level, 75% of the HHs were satisfied with the regularity of the supply, 70% with the quality of the water supplied, 70% with the colour of the water supplied, and 70% with the taste of the supplied tap water.

Overall functionality status of Odisha

At the state level, 68% of HHs received water on the day of the survey. While 54% of the HHs were found to have fully functional tap water connections within the premises. Out of which 84% received an adequate quantity of water, 69% reported receiving a fully regular supply of water, and 88% HHs received potable water.

It was found that more than 85% of households received water all 7 days a week and 6% 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 Odisha, 39% of the villages have reported that water is directly supplied to the households and the remaining 61% 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 Odisha, 8199 samples of water were submitted, and 7883 were tested at the labs. The turnaround time of testing of water sample was more than 48 hours in most cases. Given this feedback, it can be conferred that these labs have limited scope to take up samples from the general public at large on a regular basis. The different quality parameters of the collected water samples that were tested were turbidity, total hardness, total alkalinity, chloride, iron, nitrate, sulphate, total dissolved solids, bacteriological test, arsenic, and fluoride.

Residual chlorine was found within the permissible limit in 11% of the HHs. The percentage was relatively higher in AWC (more than 15%), wherein there is a possibility of additional chlorine being added locally for the purification of water. Almost all the samples passed in bacteriological parameter the RC was found only in 12 samples. 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 8199 HHs sampled for the FHTC assessment, a water quality test was carried out in 7883 due to the non-availability of water in 3% HHs on the day of the survey. pH was found within the acceptable limit in 92% of households. Among the public institution, pH was found in the acceptable limit of more than 95% in schools.

16% of villages in the state reported having available field test kits. And more than one-fifth 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 16% of villages in the state reported having a VWSC or a Pani Samiti out of which 26% of the VWSC/Pani Samitis reported to have more than 50% female members. In the state, 4% of villages reported that VWSC/ Pani Samiti is responsible for the operation and maintenance of pipe water supply.

24% of villages reported having identified skilled manpower for O&M of PWS schemes. 10% of villages in the state reported having faced challenges with respect to O&M of PWS schemes.

70% of the HHs reported that they are aware of any grievance redressal mechanism w.r.t. HH tap water through PWS, but only 5% HHs have reported a complaint in the last year and only 2% of complaints have been resolved. Among those who reported complaints (i.e., 5% HHs, 572 HHs), 86% of the HHs reported their complaints to the Pani Samiti's besides other reporting channels.

Overall, 12% of villages in the state levy charge for water service delivery to households whereas 13% HHs reported paying water service delivery charges at the households.

62% of HHs reported that their daily requirement of water was being met by HH tap connections.

Overall, 99% 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, 4% HHs reported using booster pumps to maximize the water flow through their piped water connections.

It was found that 42% of the villages have schemes that are based on groundwater sources, while 14% on surface water sources.

Age-wise functionality of the schemes indicates improvement in 'always functional' schemes and an increase in the 'non-functional scheme' in the state since 2012. 1-% point improvement

in a fully functional scheme was recorded from 2012 to 2013-18. In 2019 and later the same trend was maintained, however, 65% of schemes have been reported to be always functional and 9% of scheme was partially functional (i.e., a total of 74% of schemes).

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, 34% HHs across the state have reported that there has been a change in the no. of employment days of the adult HH members while 46% HHs reported no change.

Out of the HHs reported (i.e., 10288) that female members used to fetch water before HH tap connection, 58% reported that post-installation of HH tap connection helped reduce of time and effort in collection of water.

Across the state, 34% HHs reported that since having a functional HH tap connection the attendance of the girls going to schools has increased, while 46% HHs reported no change in attendance which could possibly be an impact of shutting down of schools due to COVID-19 related lockdown during the survey period.

Functionality Status of Har Ghar Jal Districts

At the state level for Har Ghar Jal districts, 62% of households received water on the day of the survey. While 57% of the households were found to have fully functional tap connections. Out of which 83% received an adequate quantity of water, more than two-third (70%) reported receiving a fully regular supply of water and 89% received potable water.

Since having a functional HH tap connection, 31% 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, 54% reported that post-installation of HH tap connection helped reduce time and effort in collecting water. Across the Har Ghar Jal district, 21% 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, 77% of households received water on the day of the survey. While 47% of the households were found to have fully functional tap connections. Out of which 83% received an adequate quantity of water, more than three-fifth (62%) reported receiving a fully regular supply of water and 85% received potable water.

Since having a functional HH tap connection, 34% 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, 51% reported that post-installation of HH tap connection helped reduce time and effort in collecting water. Across the aspirational district, 20% 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	Odisha
Working tap connections- HHs which received water through tap connection at least once in last 7 days (%)	86	68
Quantity[1] of water received by households		
Adequate quantity (>55 LPCD) (%)	85	84
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	5	7
Inadequate quantity (<40 LPCD) (%)	10	9
Regularity[2] of water received by households		
Fully Regular Supply (as per schedule) (%)	80	69
Partially Regular Supply (not as per schedule) (%)	14	23
Irregular Supply (less than 9 months' supply) (%)	6	8
Potable[3] (Quality) water received by households (%)	87	88
Overall functionality[4] (%)	62	54

Service delivery parameters	India	Odisha
Overall user satisfaction on regularity at the household level (%)	83	75
Overall user satisfaction on quality at the household level (%)	82	70
Households receiving water supply daily-7 days a week (%)	74	85
Daily HH requirement of water being met by FHTC (%)	80	62
Households paying water service delivery charges (%)	35	13
Households aware of grievance redressal mechanism (%)	71	70
Households reported a reduction in time and effort in collecting water (%)	79	58
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 with in permissible limits (%)	24	11
Villages with Field Test Kits (%)	30	16
Villages in which bacteriological test was done in last 1 year by VWSC/ Pani Samiti (%)	29	22
Villages reported to have a mechanism for chlorination (%)	21	2

Institutional arrangement	India	Odisha
Village reported having presence of VWSC/ Pani Samiti (%)	38	16
Villages in which VWSC/ Pani Samiti is responsible for Operation & Maintenance of PWS schemes (%)	14	4
Villages in which persons are trained to use Field Test Kits (%)	31	22
Villages levying water service delivery to households (%)	34	12
Villages having skilled manpower for Operation & Maintenance of PWS schemes (%)	31	24
Community monitoring of water wastage in villages (%)	19	14
Villages in which signages about JJM were observed (%)	15	12

[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

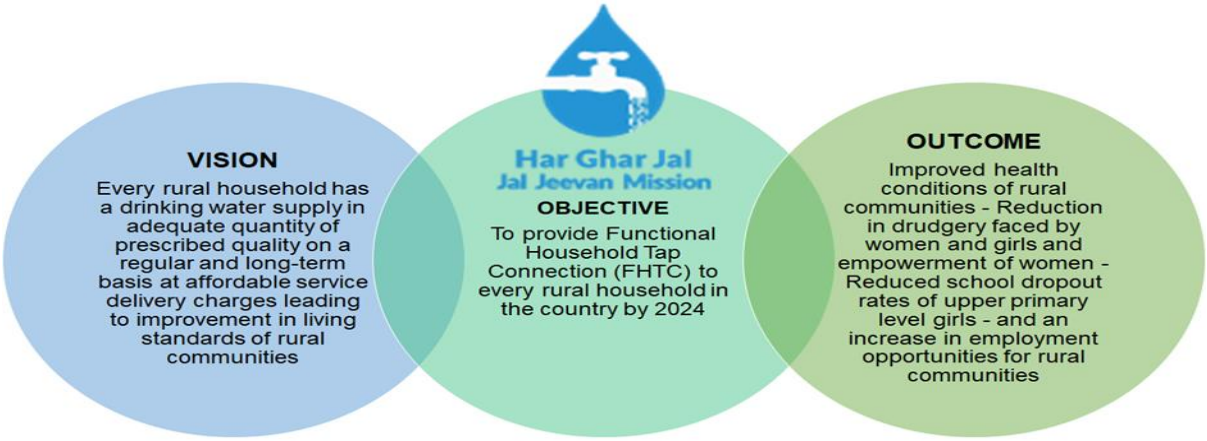
Functionality status of tap connection at households in Har Ghar Districts	India	Odisha
Working tap connections- HHs which received water through tap connection at least once in last 7 days (%)	91	62
Quantity of water received by households		
Adequate quantity (>55 LPCD) (%)	88	83
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	4	7
Inadequate quantity (<40 LPCD) (%)	8	10
Regularity of water received by households		
Fully Regular Supply (as per schedule) (%)	84	70
Partially Regular Supply (not as per schedule) (%)	11	21
Irregular Supply (less than 9 months' supply) (%)	5	9
Potable (Quality) water received by households (%)	90	89
Overall functionality (%)	69	57

Functionality status of tap connection at households in Aspirational Districts	India	Odisha
Working tap connections- HHs which received water through tap connection at least once in last 7 days (%)	78	77
Quantity of water received by households		
Adequate quantity (>55 LPCD) (%)	85	83
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	5	8
Inadequate quantity (<40 LPCD) (%)	10	9
Regularity of water received by households		
Fully Regular Supply (as per schedule) (%)	77	62
Partially Regular Supply (not as per schedule) (%)	14	31
Irregular Supply (less than 9 months' supply) (%)	9	7
Potable (Quality) water received by households (%)	88	85
Overall functionality (%)	62	47

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: Odisha

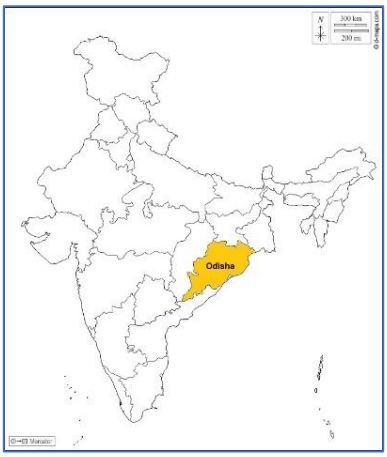
The state of Odisha lies on the eastern part of India and has a population of 4,19,74,218 people. It has 30 districts and 47412 villages where 23150 villages have PWS schemes. The state lies on the Eastern Plateau and Hills region and the East Coast Plains and Hills region and receives an average annual rainfall of about 1447.8mm. Among the villages with PWS schemes, 19607 villages (41.35%) 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:

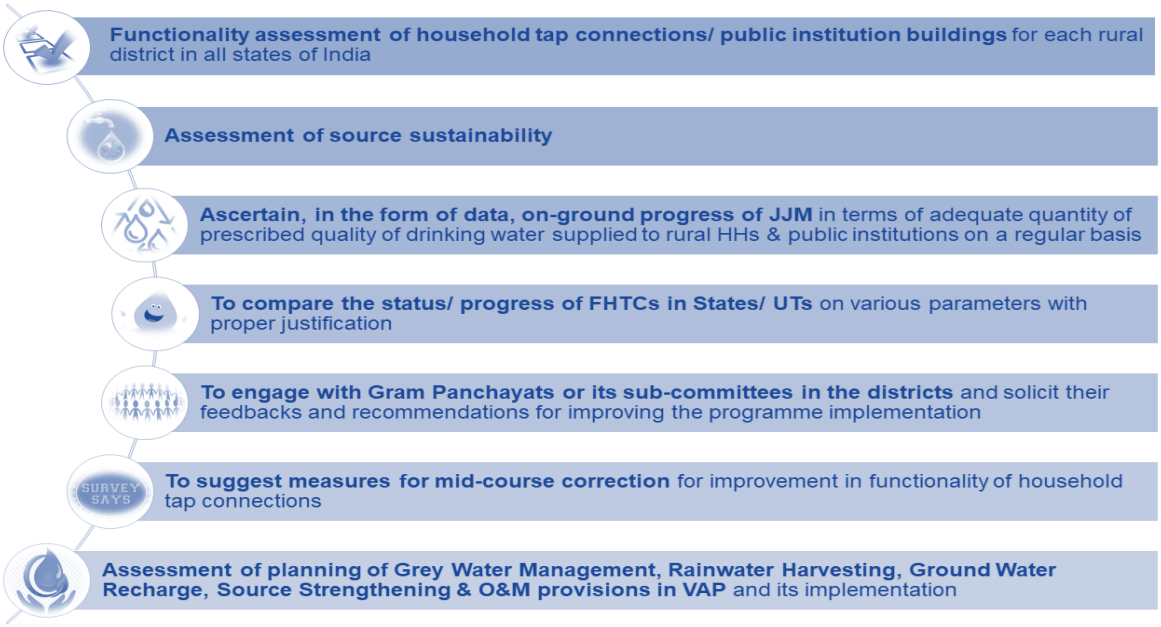
- Not a Har Ghar Jal state.
- 28 districts are Iron & 20 districts are Fluoride affected
- 19607 (41.35% of all) villages with PWS more than 20 FHTC
- 13.65% villages covered under HH tap connections under HGJ



2.2. FHTC Assessment Objectives

The overall objectives of the FHTC assessment are as presented:

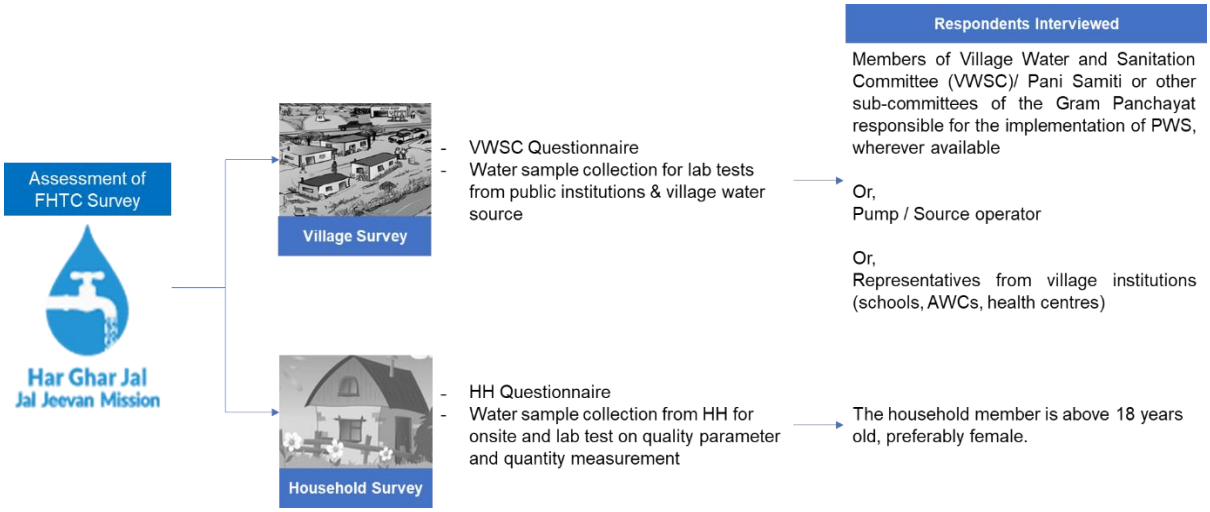
Figure 4: FHTC Assessment Objectives



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.

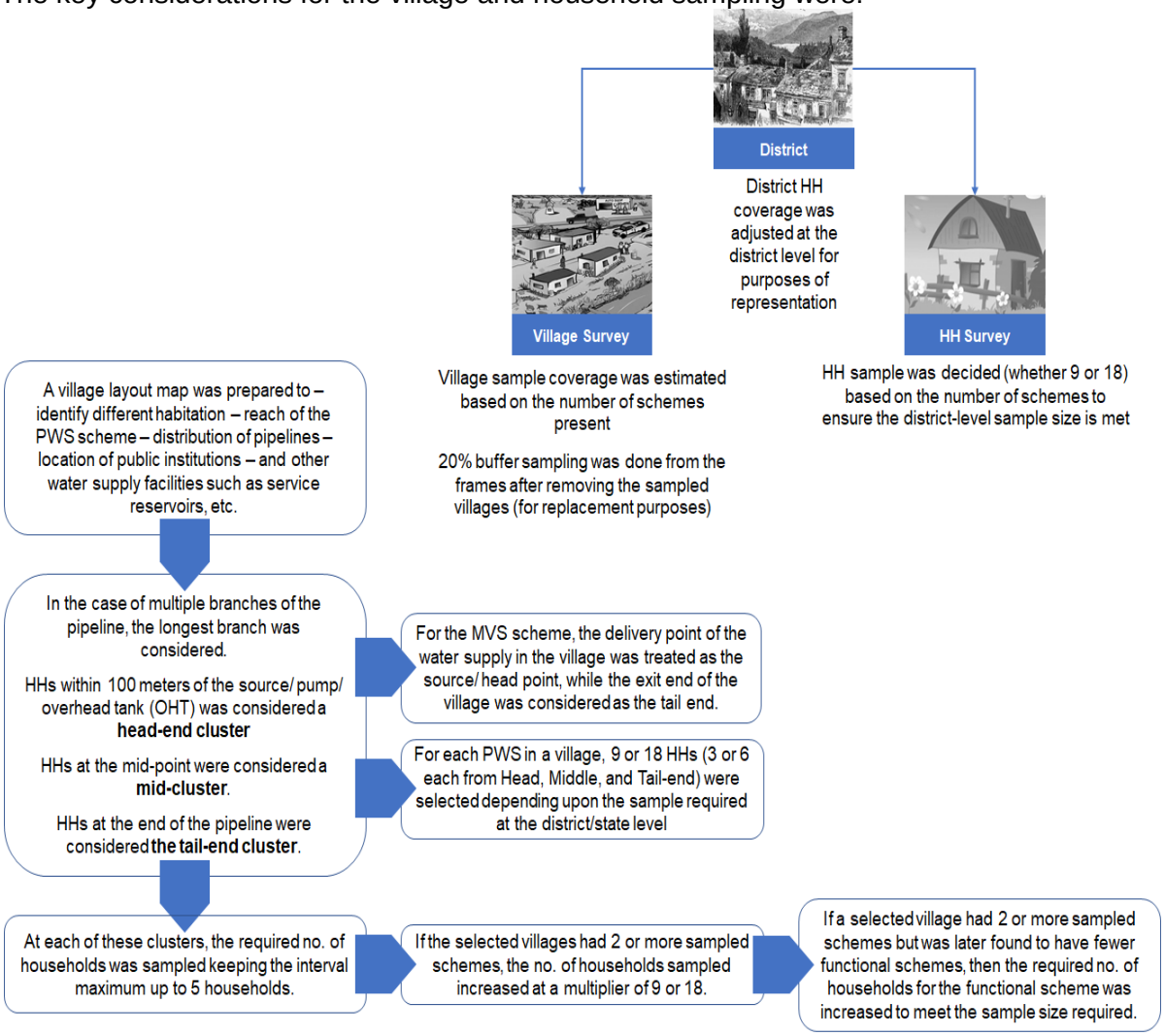
2.5. Sampling Methodology

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:

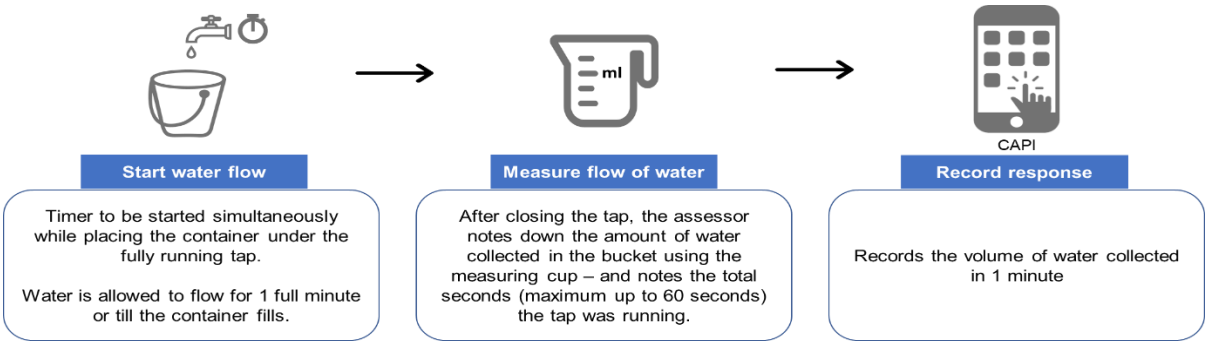


The record of all district-wise village replacements is maintained and reported as part of the annexure.

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:

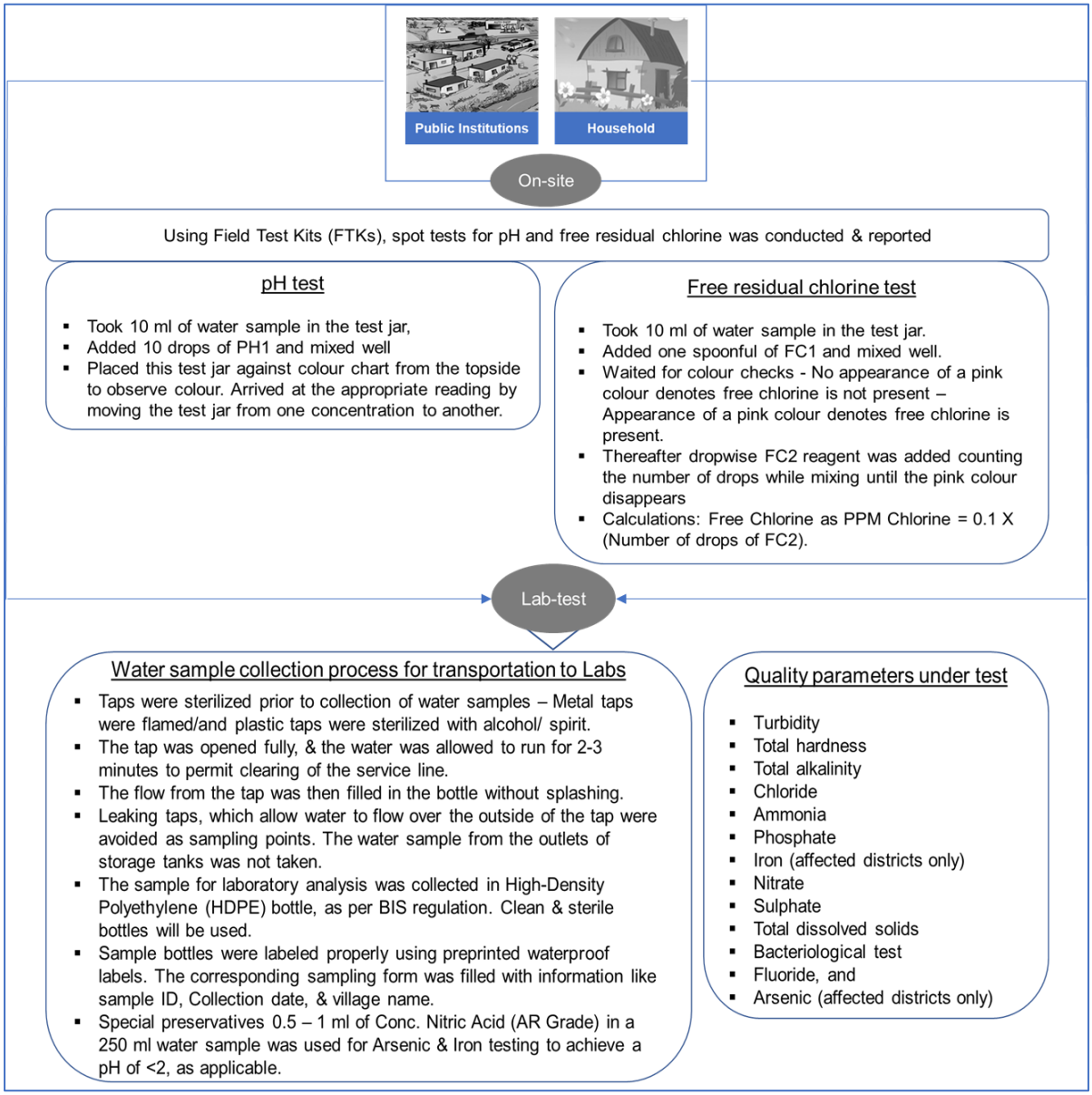
- Assessor first asked and recorded length, breadth, and height.
- Assessor dipped a 5 feet long rod, marked the level of the water table, and calculated the volume – length x breadth x-height of water.
- Next the assessor opened the valve of the connection and allowed the water to flow inside the storage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

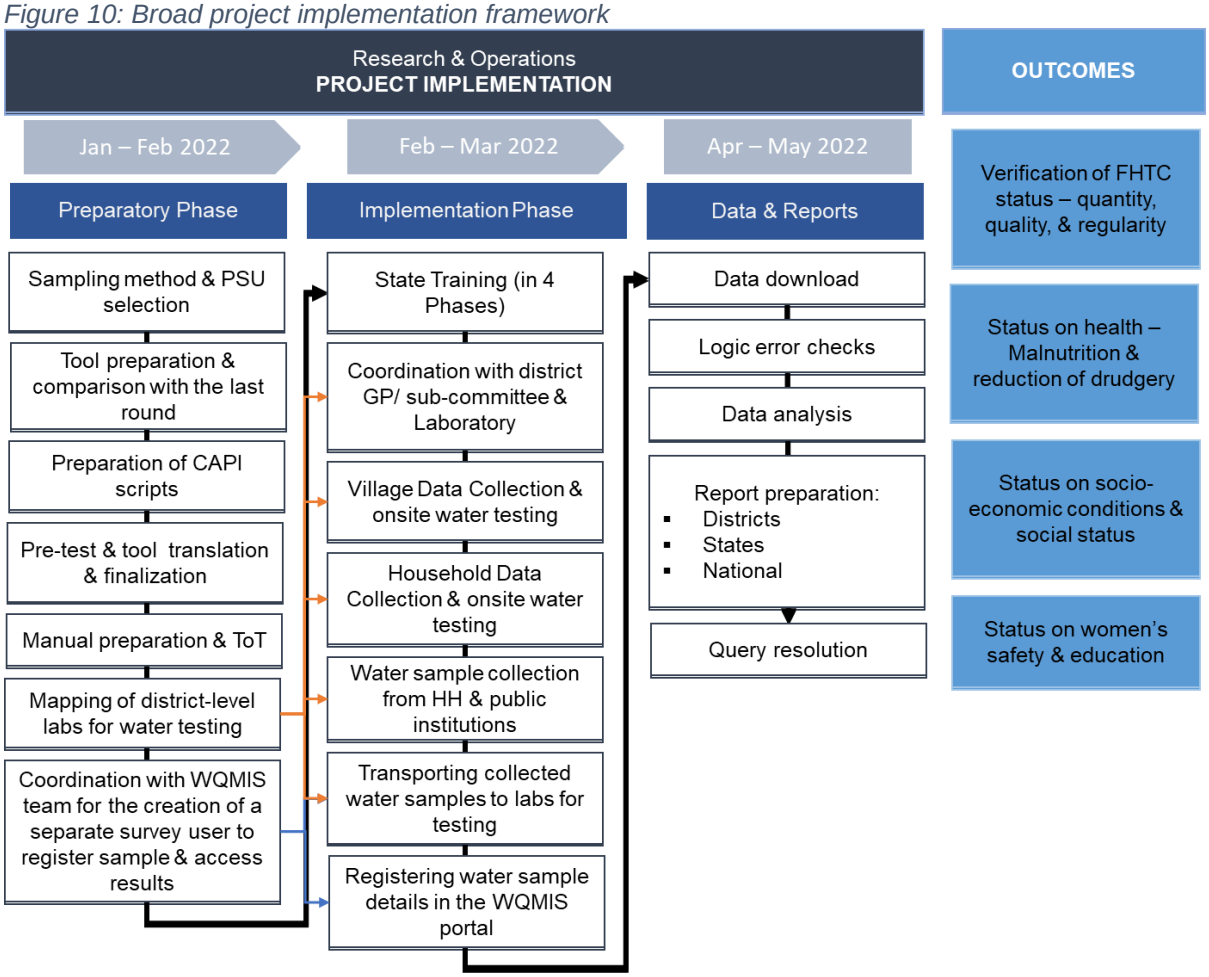


JJM, with the support of the BMI Division of ICMR, enabled a new interface on the WQMIS portal for "Functionality Assessment (FA) User" to enable seamless harmonization of water sample registration, and sample submission for testing, and sharing of results as per the applicable quality parameters.

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 Odisha. 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
Odisha	8 Teams	20th February	10th April	45 Days

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

2.9. Sample coverage

Table No. 2:	Sample covered						
	Targeted sample			Achieved sample			
State	District	Village	HH	District	Village	HHs	PIs
India	**712**	**13,300**	**3,00,000**	**712**	**13,299**	**3,01,389**	**16,148**
Odisha	**30**	**504**	**11,817**	**30**	**504**	**11,652**	**266**

2.10. Sampled village and household profile

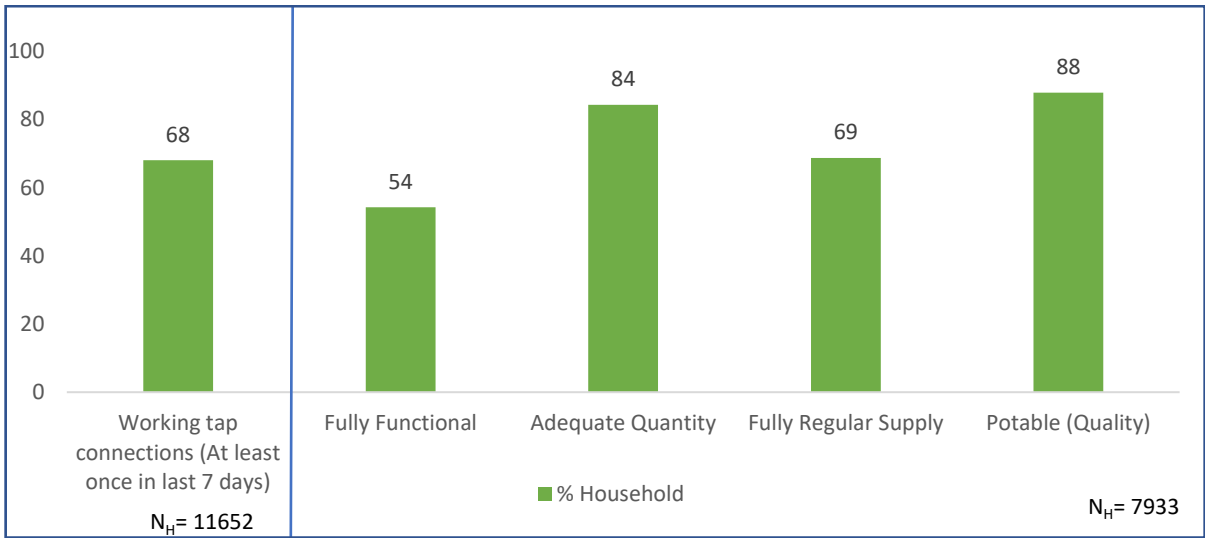
SAMPLED VILLAGES	SAMPLED HOUSEHOLDS
• Total no. of villages covered in the state **– 504** • Percentage of SC dominated villages **– 7.1%** (while at national level the average is 12.6%) • Percentage of ST dominated villages **– 33.3%** (while at national level the average is **20.2%)** • Higher proportion of **pump operator** interviewed at the village level • **22.4%** of the villages reported to have any historical incidence of water contamination	• Total no. of households covered in the state **– 11,652 (Respondents: Male 4,150, Female 7502)** • Proportion of General – **24.7%**, SC **19.9%**, ST **24.4%**, OBC **31.0%** households • **64.4%** of the FHTC connections are under the name of a female member • Average household size **– 5.1** • **100%** positive user experience in 0/5 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=7933 implies all HHs where water was found on the day of the survey.

It has been found that 68 percent of the sampled HHs (N=11652) had working tap connections. Moreover, more than 4 out of 5 households (84 percent) received adequate quantity (>=55 LPCD) water supply and more than 3 out of 5 received regular supply (69 percent) of water. The on-site testing and lab test results of the water indicates that more than four-fifth (88%) of the sampled households in the state receive potable water.

Out of the 11652 HHs sampled for the FHTC assessment, water was not available in 3719 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.	Boudh	19	73	80	97
2.	Debagarh	23	91	58	100
3.	Jajpur	44	81	85	59
4.	Kendujhar	44	94	91	76
5.	Angul	50	27	45	82
6.	Jagatsinghapur	51	97	75	91
7.	Sundargarh	57	68	61	91
8.	Bhadrak	58	94	91	88
9.	Balangir	60	95	63	100
10.	Subarnapur	64	84	90	100
11.	Cuttack	65	78	49	86
12.	Dhenkanal	67	44	22	87
13.	Kalahandi	67	82	61	85
14.	**ODISHA**	**68**	**84**	**69**	**88**
15.	Puri	69	74	75	79

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)
16.	Khurda	69	86	86	100
17.	Nayagarh	71	93	81	100
18.	Jharsuguda	72	97	67	92
19.	Koraput	76	90	80	44
20.	Balasore	77	96	80	80
21.	Mayurbhanj	77	90	75	85
22.	Malkangiri	80	83	42	91
23.	Nuapada	81	90	64	100
24.	Nabarangapur	82	99	69	99
25.	Kendrapara	83	93	78	87
26.	Kandhamal	86	82	81	99
27.	Rayagada	88	81	72	93
28.	Ganjam	88	83	82	99
29.	Gajapati	90	80	63	57
30.	Sambalpur	95	93	58	97
31.	Bargarh	100	91	49	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

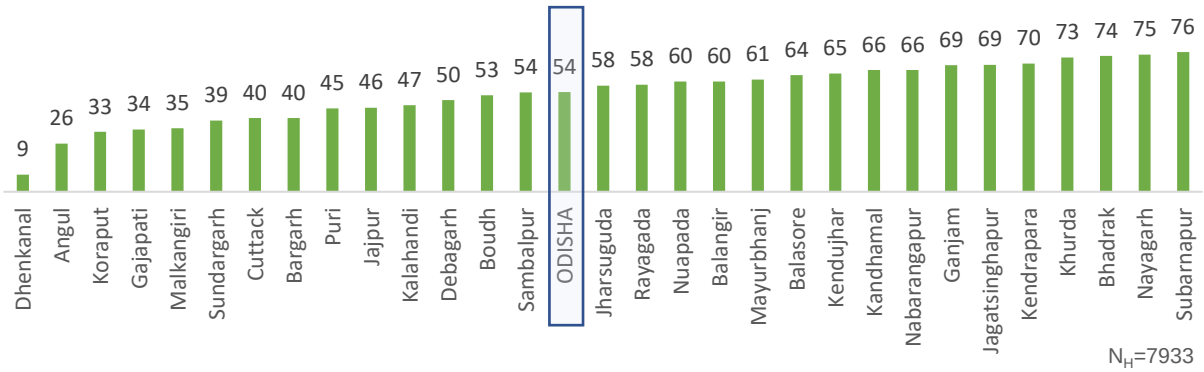
District level comparison across the districts indicate that Boudh, Debagarh, Jajpur, Kendujhar, Angul, Jagatsinghapur, Sundargarh, Bhadrak, Balangir, Subarnapur, Cuttack, Dhenkanal, and Kalahandi districts reported functionality less than the state average. The districts of Balangir, Balasore, Jagatsinghapur, Jharsuguda and Nabarangapur FHTC provide more than 55 LPCD of water in more than 95 percent HHs.

More than 90 percent HHs in the districts of Bhadrak and Kendujhar reported to regularly receive water through FHTC. Regular supply of water is less than 50 percent in the districts of Dhenkanal, Malkangiri, Angul, Cuttack and Bargarh.

Potability of water was found to be more than 95 percent in districts of Sambalpur, Boudh, Nabarangapur, Ganjam, Kandhamal, Subarnapur, Nuapada, Debagarh, Balangir, Nayagarh and Khurda. It was found to be less than 50 percent in the district of Koraput.

B. District wise functionality status

Figure 12: District wise Functionality of HH tap connection



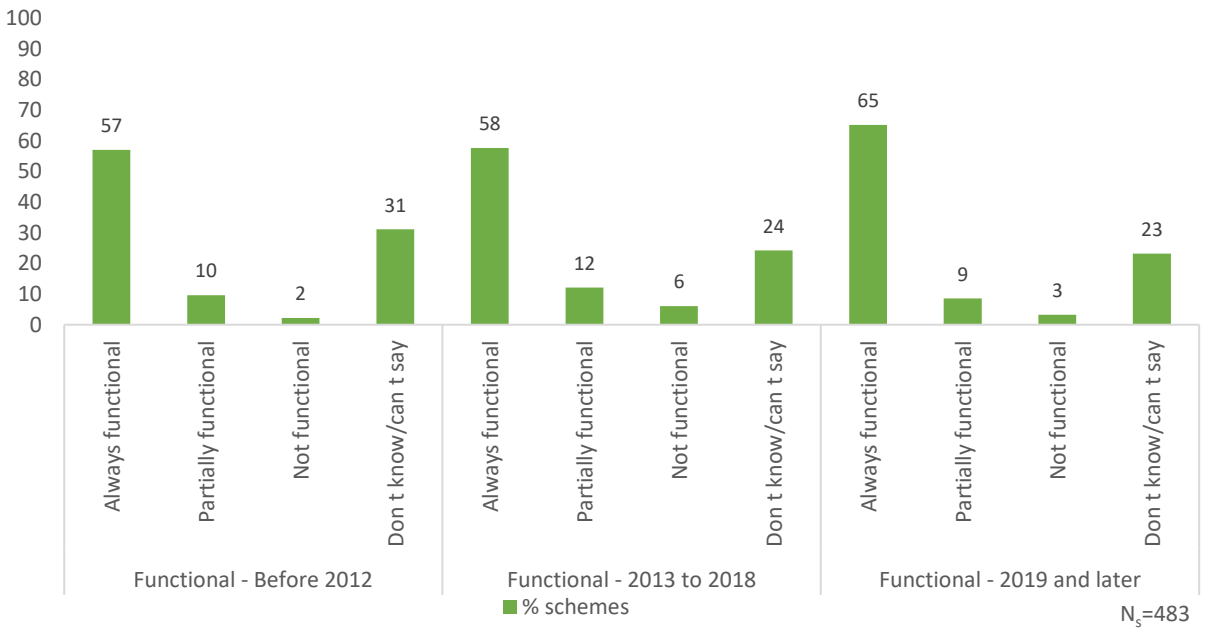
** 'Functionality' has been computed as the intersection of Adequate Quantity, Fully Regular Supply and Potable (Quality) for households wherein water supply was available at the time of survey, i.e., 7933 HHs.*

54 percent HHs in the state were found to have functional HH tap water connection. Subarnapur district reported 76 percent functional households in the state, followed by Kendrapara, Khurda, Bhadrak, and Nayagarhwith more than 70 percent. In the districts of Dhenkanal less than one-tenth 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 5 out 10 schemes were functional before 2012 and more than 5 out of 10 were functional from 2013-18 which reflects a 1-point increase and similar trend was observed from 2019 and later reflecting 7 percent increase.

Figure 13: Age vs functionality of schemes in the villages



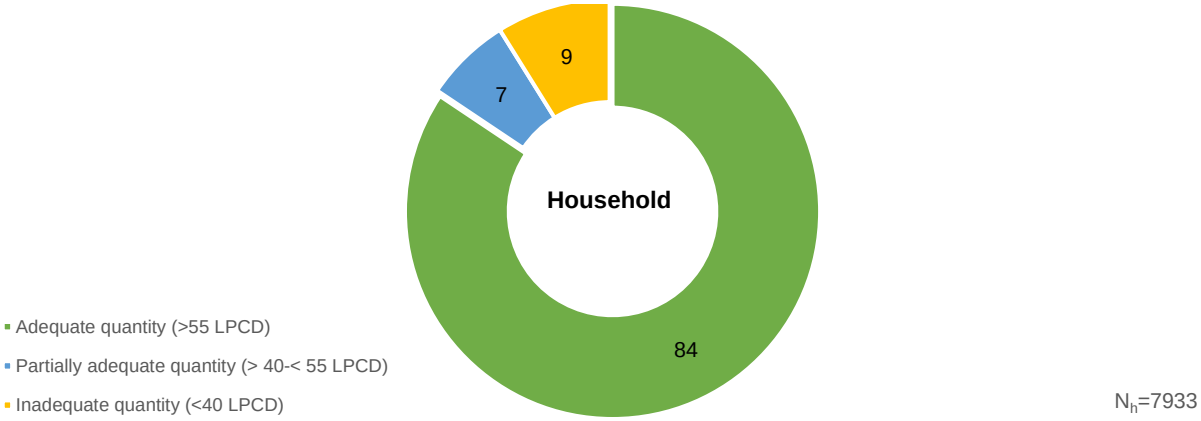
3.2. Quantity, Regularity, and Quality of Water

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)

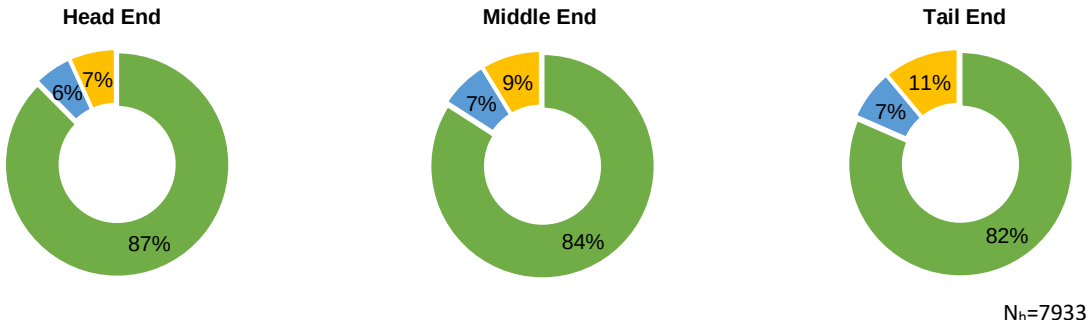
84% HHs reported receiving adequate quantity of water (more than 55 LPCD of water)

Figure 14: Quantity of water received by households



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

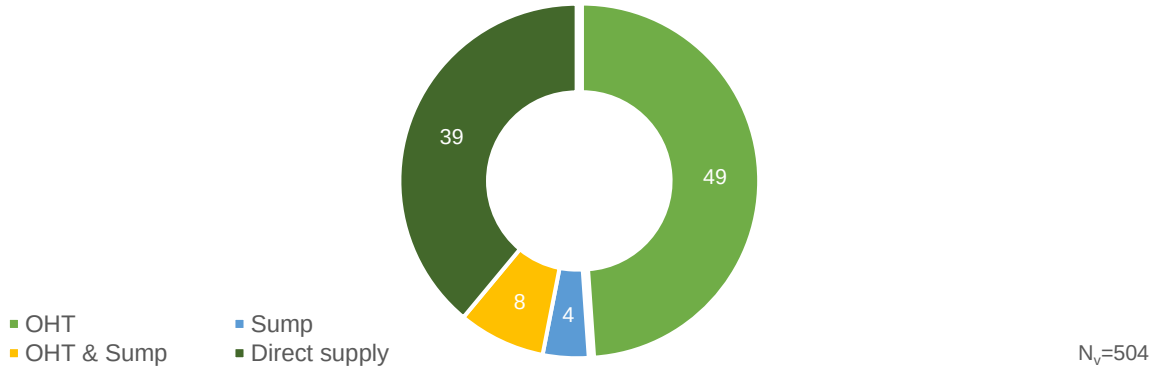
Figure 15: Quantity of water received across head, middle and tail end households



The quantity of water received across the head, middle, and the tail end was observed to have declined, and more than four-fifth (84%) of the sampled households received water in adequate quantity, i.e., greater than or equal to 55 LPCD.

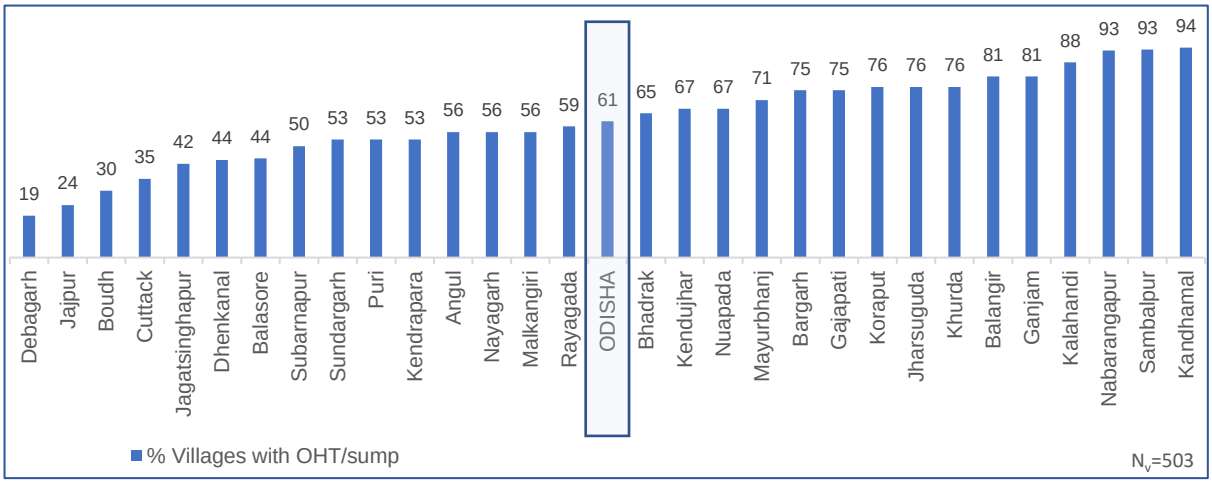
Types of water storage arrangements at village level (in %)

Figure 16: Pipe water supply storage available in village



More than one out of three respondents in the state reported water being directly supplied. And in 61 percent reported water being stored in sump and overhead tanks.

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

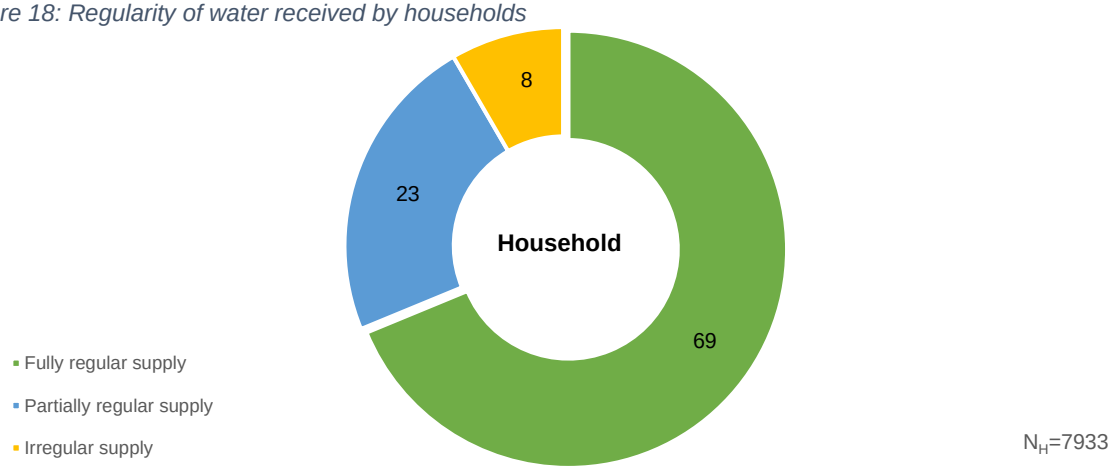


61 percent villages in the state have either an OHT or a sump for storing water for supplying to the households. Nabarangapur, Sambalpur and Kandhamal are the districts where more than 90 percent of the villages have either an OHT or a sump, followed Balangir, Ganjam and Kalahandi where more than 80 percent of the villages have facilities to store water for supplying to the households.

B. Regularity of water supply to households

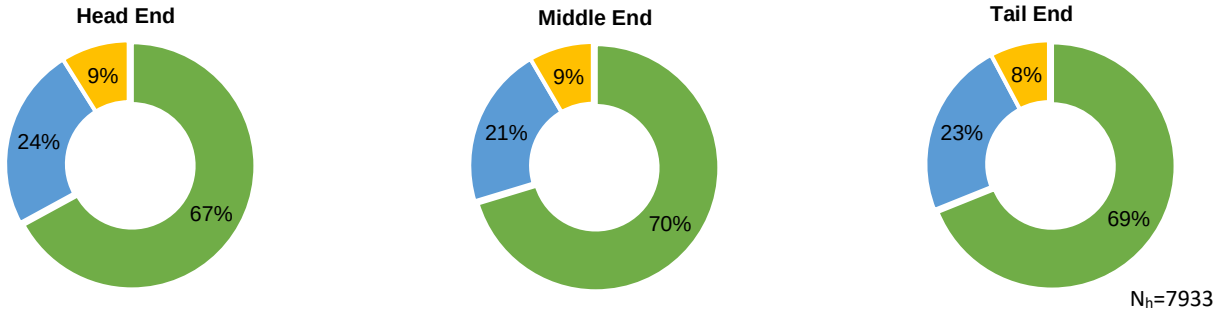
69% HHs receive a regular supply of water (as per agreed schedule).

Figure 18: Regularity of water received by households



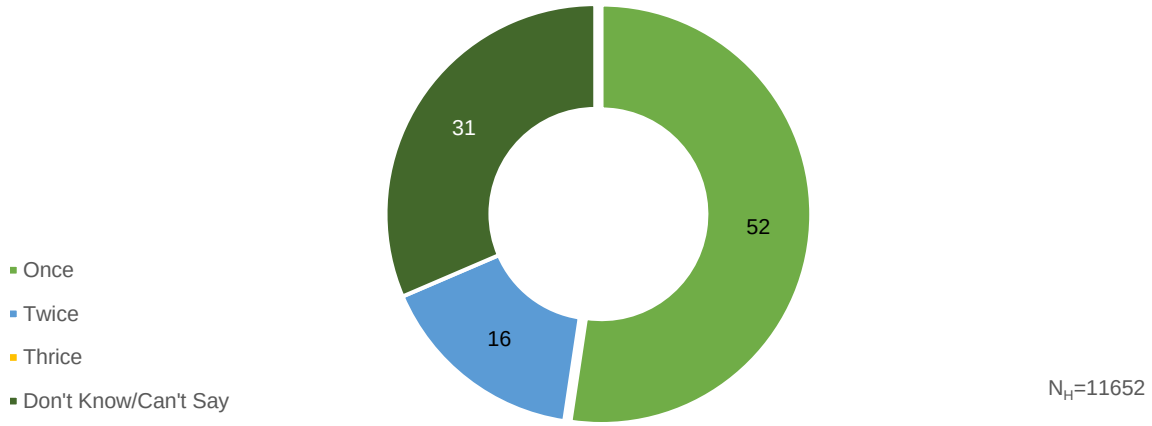
Regularity of water received across head, mid, and tail end

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



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

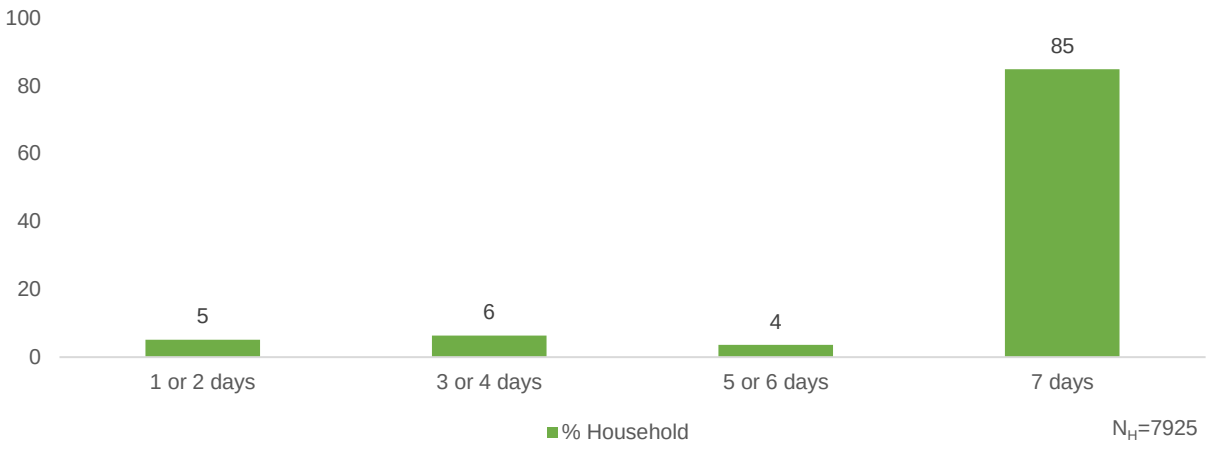
Figure 20: Average no. of times water is supplied in a day



HHs in **52 percent of districts** receive water once a day. The average duration of water supply across the state was reported to be **1 hours per day.**

Average water supply days in a week to households

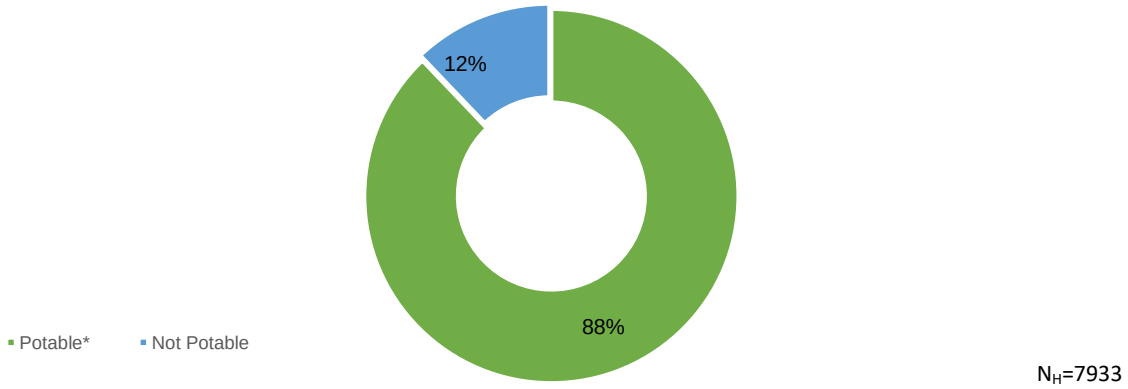
Figure 21: Average number of days households receive water supply in a week (in %)



85 percent of households receive water seven days a week (daily).

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 Odisha where water was found on the day of the survey, the potability of water was found to be 88%.

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

Quality Parameters (N_v=504)	Water Samples Tested from Public Institutes			
	Anganwadi Centre	Health Facility	Schools	Others
pH (on-site)	90	58	95	90
Turbidity	100	100	99	100
Total Hardness	100	100	100	100
Total Alkalinity	100	100	100	100
Chloride	98	100	99	100
Ammonia	Not tested			
Iron	97	100	95	100
Nitrate	100		100	
Sulphate	100		100	
Total Dissolved Solids	100	100	100	100
Bacteriological Test (Absence)	100	100	100	100
Fluoride	100	100	100	100
Arsenic	Not tested			

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

The number of water samples submitted to the laboratory for the calculation of the different parameters was the same as mentioned in the rest of the report (sample size for HH water submitted to labs=7933). 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)	7933	100
Turbidity	6941	98
Total Hardness	7666	100
Total Alkalinity	7684	100
Chloride	7362	100
Ammonia	Not tested	
Iron	7161	97
Nitrate	199	100
Sulphate	408	100
Total Dissolved Solids	7480	100
Bacteriological Test (Absence)	7656	100
Fluoride	4714	100
Arsenic	Not tested	

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

The Residual Chlorine (RC) in the state of Odisha was found in 11% samples. Out of which less than 1% samples were having RC outside range whereas 89% samples, had no RC. All of the water samples passed the bacteriological contamination test.

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 10 water quality parameters. 8199 water samples were submitted, and 7883 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	Sambalpur	Yes	378	375	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
2	Sundargarh	Yes	378	227	218	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
3	Kendujhar	Yes	396	185	184	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	Mayurbhanj	Yes	397	323	309	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	Balasore	Yes	358	291	284	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	Cuttack	Yes	424	286	270	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	Dhenkanal	Yes	432	294	275	The labs did not have any issue with testing the number of water samples submitted nor had any

Table No. 6: Performance of Labs

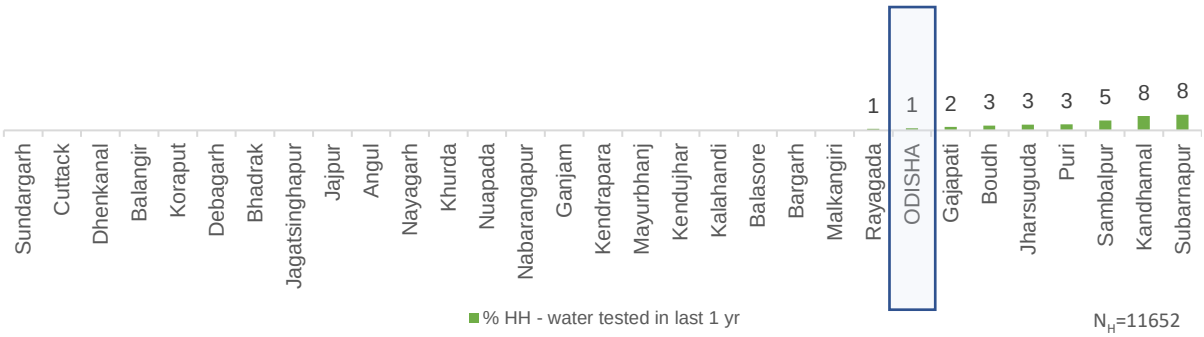
Sl. No	District	Lab available	HH surveyed	Samples submitted	Report received	Overall lab experience
						issues with human resource, reagents etc
8	Kandhamal	Yes	378	331	323	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
9	Balangir	Yes	378	243	217	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	Kalahandi	Yes	378	277	266	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	Koraput	Yes	379	296	295	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	Ganjam	Yes	441	390	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
13	Puri	Yes	379	262	258	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	Bargarh	Yes	351	371	356	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	Jharsuguda	Yes	396	296	280	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	Debagarh	Yes	390	90	90	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	Bhadrak	Yes	375	224	223	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	Kendrapara	Yes	414	349	281	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	Jagatsinghapur	Yes	405	212	208	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
20	Jajpur	Yes	414	185	182	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
21	Angul	Yes	396	203	200	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	Nayagarh	Yes	416	299	297	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	Khurda	Yes	405	286	285	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	Gajapati	Yes	372	335	331	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	Boudh	Yes	384	82	71	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	Subarnapur	Yes	382	252	243	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	Nuapada	Yes	378	317	272	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	Rayagada	Yes	371	331	331	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	Nabarangapur	Yes	396	334	328	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	Malkangiri	Yes	311	253	249	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

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

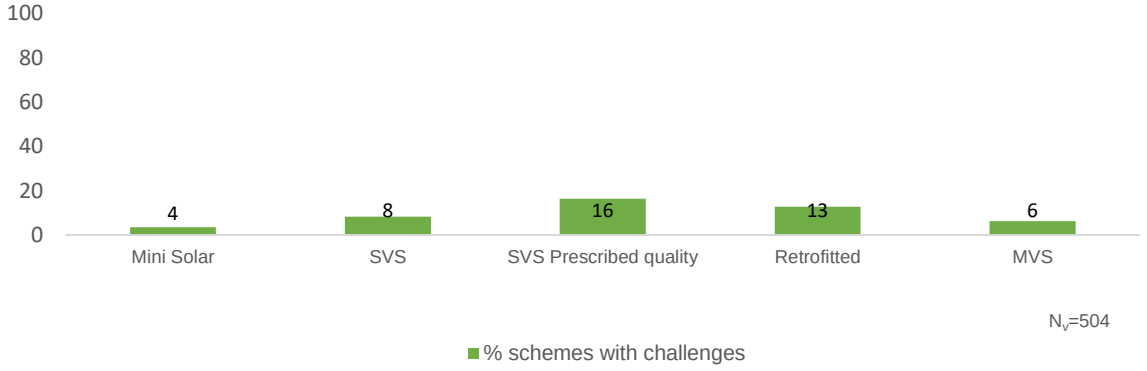


3.3. Operation and Maintenance (O&M) of schemes at village level

Schemes reported to have faced challenge in village

The SVS prescribed quality scheme faced the most challenges (16%) in comparison to the other schemes in the state

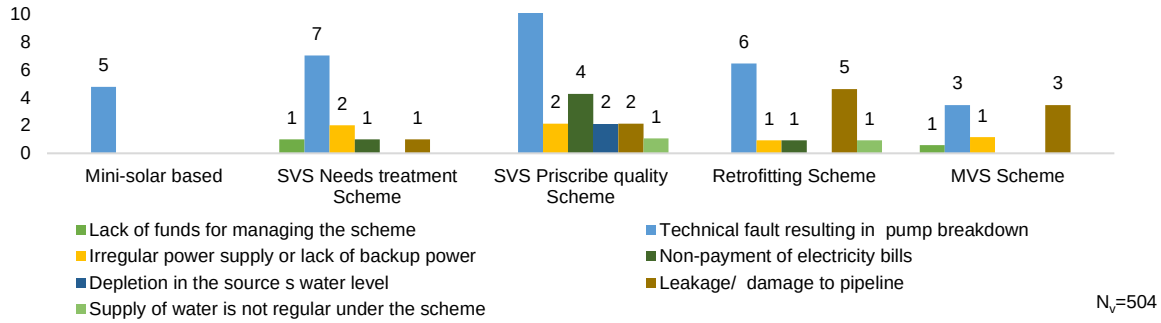
Figure 23: Schemes reported to have faced challenge in village



Type of challenge faced by the schemes

The most faced problem varied from one scheme to another. However, 'Technical fault resulting in pump breakdown' is a problem that was found unanimously in all the schemes.

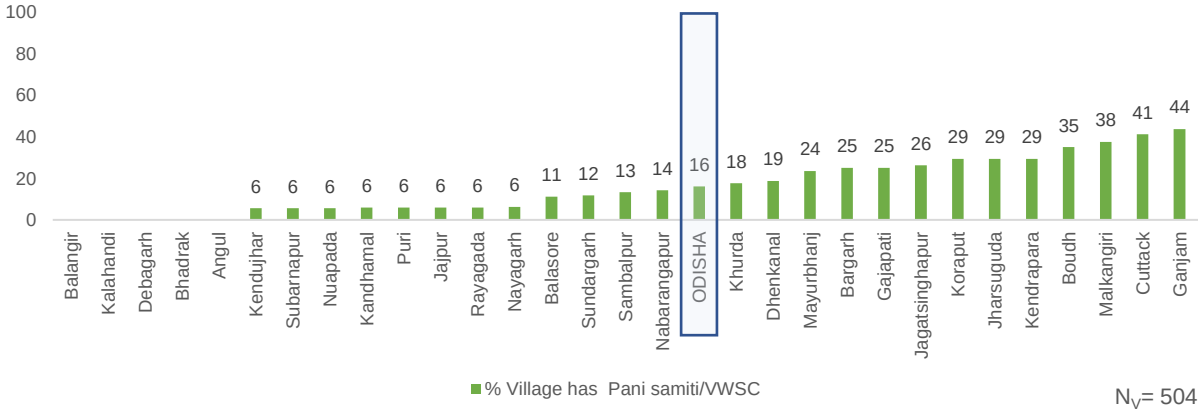
Figure 24: Type of challenge faced by the schemes



A. Presence of VWSC/Pani Samiti

16 percent of villages in the state reported to have a VWSC or a Pani Samiti.

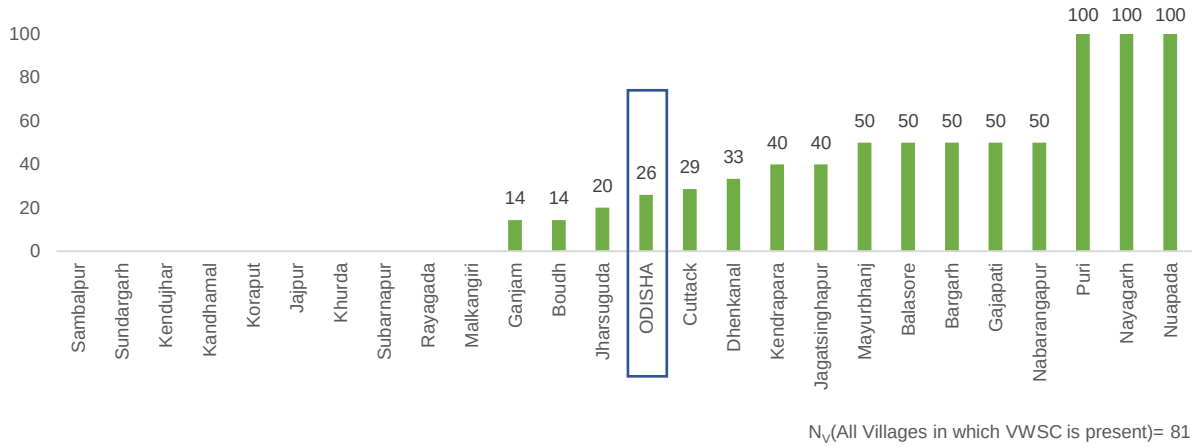
Figure 25: Villages where VWSC/ Pani Samiti is present



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

About 26 percent of the VWSC/Pani Samitis in Odisha were having more than 50 percent female members

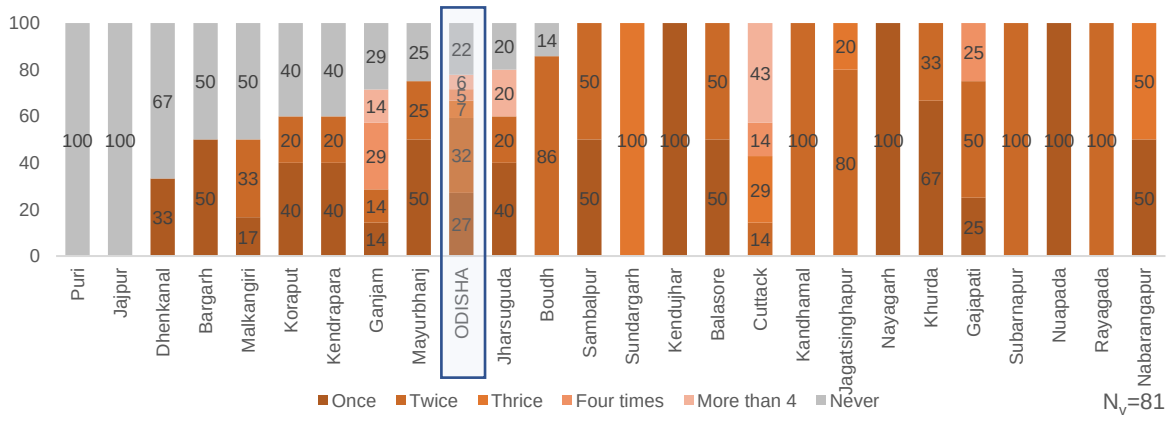
Figure 26: VWSC/ Pani Samiti with more than 50 percent female members



C. VWSC Meetings in last one year

Across the villages in the state, that reported to have VWSC/Pani Samitis (81 villages), 2 meetings in last one year was reported the most (32 percent)

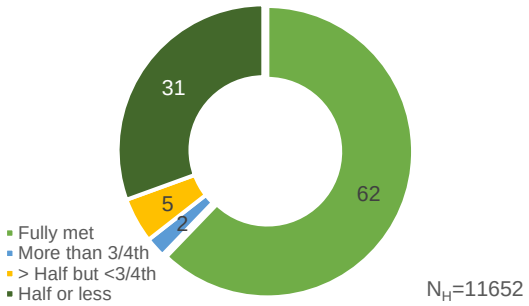
Figure 27: VWSC meetings held in last one year



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

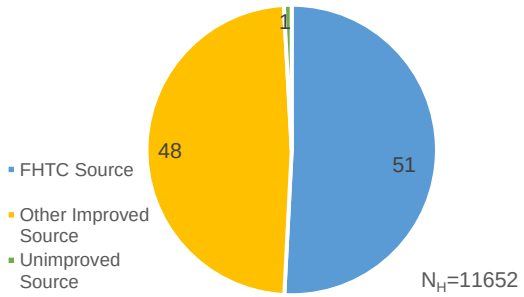
62% of HHs reported that their daily requirement of water was being met by HH tap connections

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



51% HHs reported HH tap connections as their primary source of drinking water

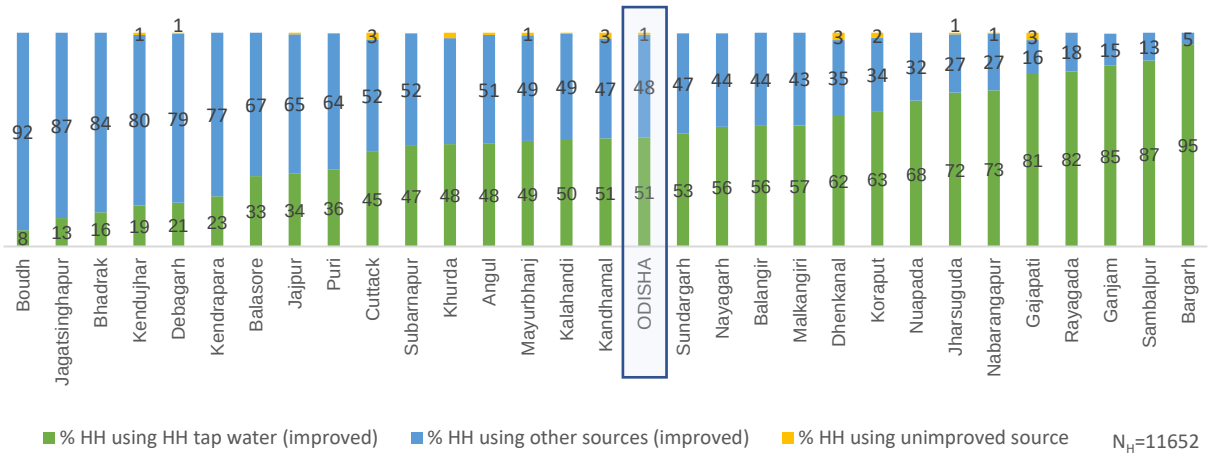
Figure 28: Households reported FHTC as primary source of drinking water



About 2 out of 3 (62 percent) HHs reported their daily requirement of water being fully met by the HH tap connections. And 51 percent HHs reported used household tap connection for drinking water (primary source). About 48 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, **99 percent of HHs** reported using improved primary source of drinking water, out of which **51 percent of HHs** reported HH tap water as their primary source.

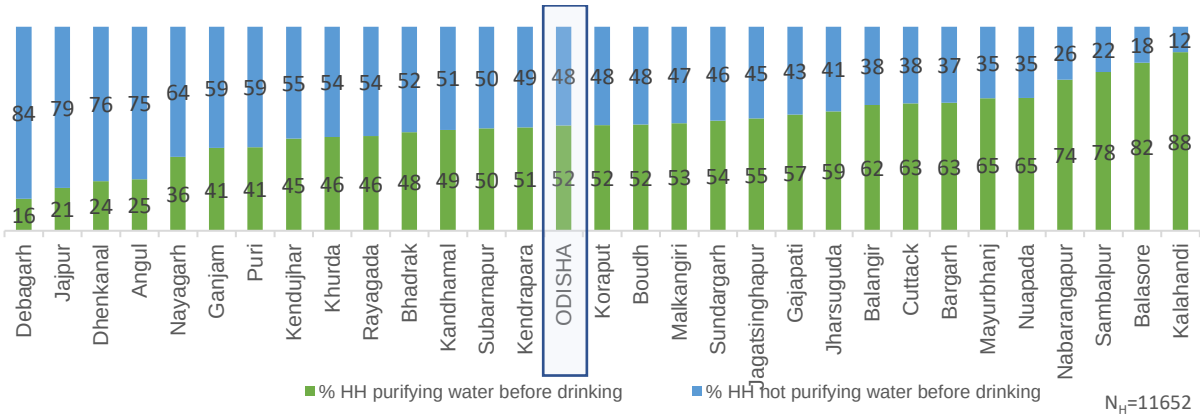
Figure 30: District wise distribution of household's reported FHTC as primary source of drinking water



A. Households who practice of purifying water before drinking

Practice of purifying water before drinking was reported the most in Kalahandi (88 percent) where 50 percent HHs reported using HH tap water as primary drinking water source, while the least was reported in Debagarh (16 percent) where 21 percent HHs reported using HH tap water as a primary drinking water source.

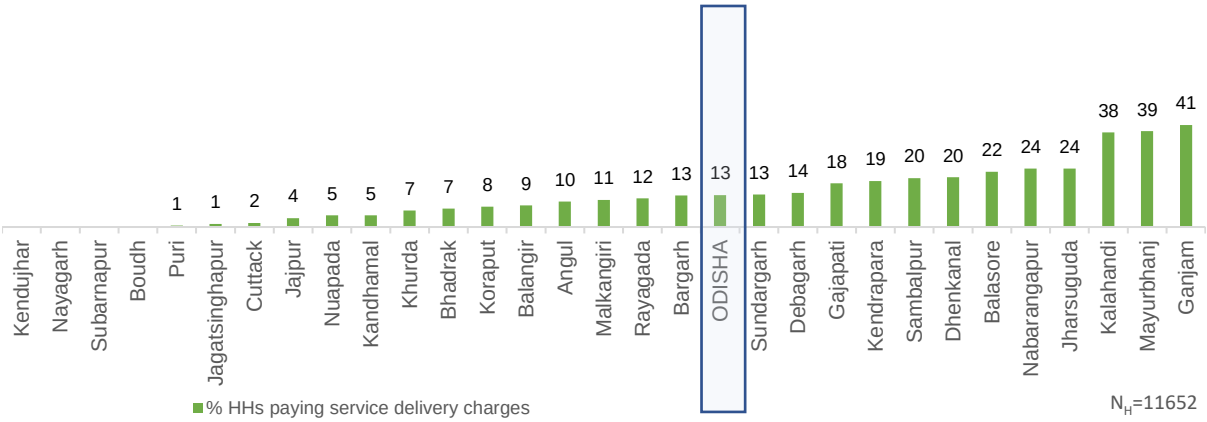
Figure 31: Households who practice of purifying water before drinking



B. Households paying water service delivery charges

In Odisha, around 13% of the sampled households were found to be paying service delivery charges, Ganjam being the district with the highest percentage of such households (41%) and Boudh, Subarnapur, Nayagarh and Kendujhar being the districts in which households reported not paying any water service delivery charges.

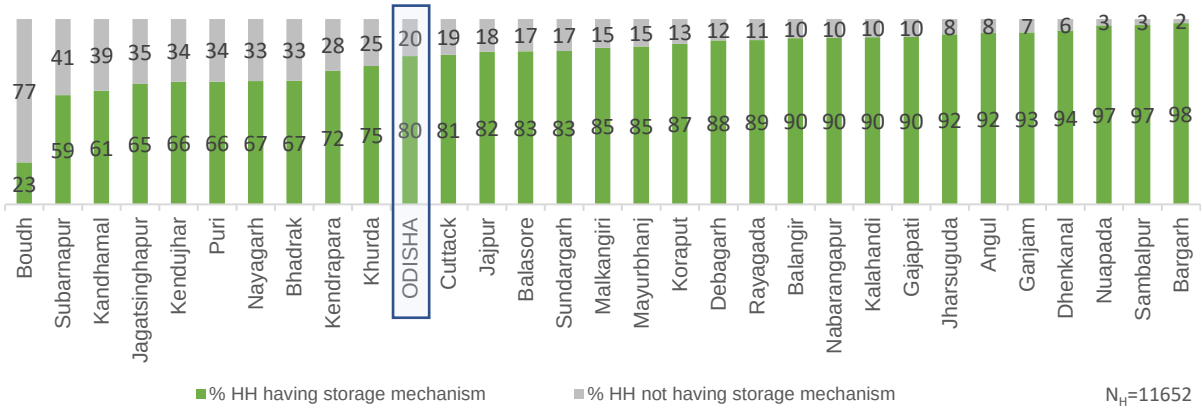
Figure 32: Households paying water service delivery charges



C. Storage mechanism used by households

Overall, 80% households in Odisha were found to use some mechanism to store water in the household.

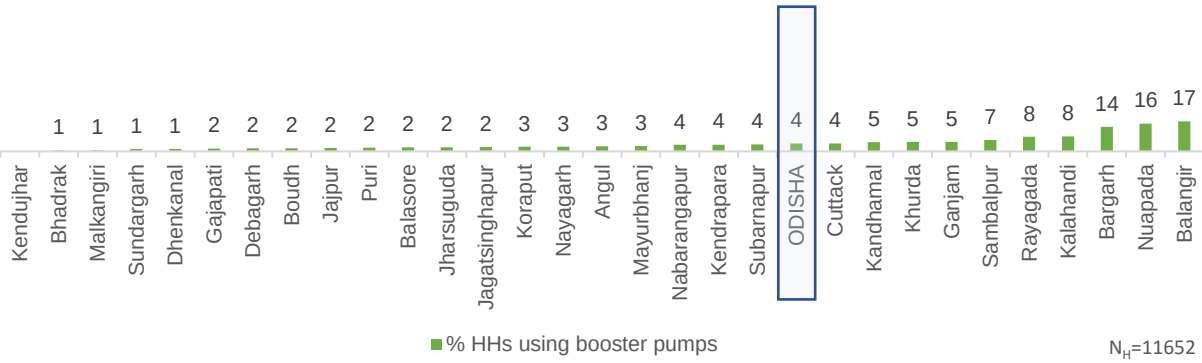
Figure 33: Households reported using some storage mechanism



D. Households using booster pumps

Overall, **4 percent HHs** reported using booster pumps to maximize the water flow through their piped water connections. Balangir and Nuapada reported 17 percent and 16 percent of HHs using booster pump in the state while Kendujhar reported none.

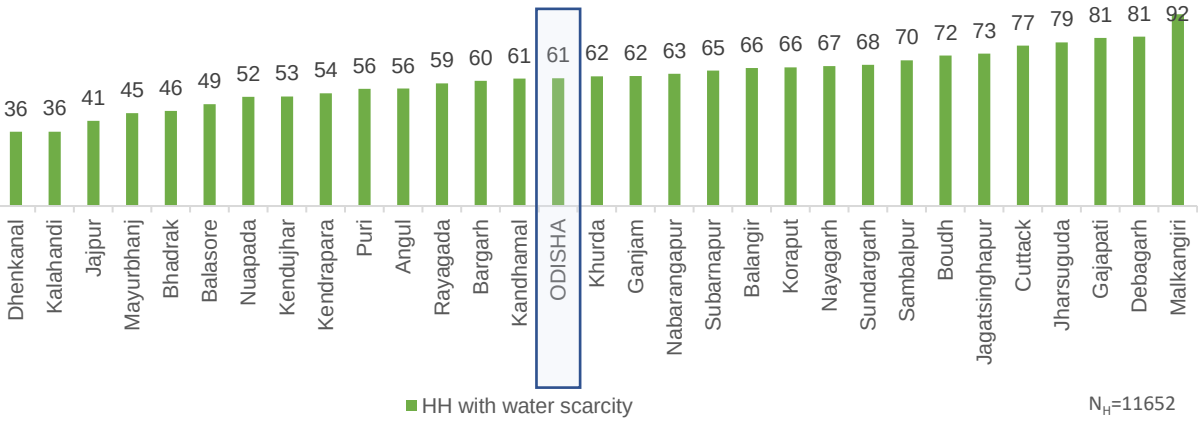
Figure 34: Households reported to use of booster pumps



E. Households who faced shortage of water

In the state, **61% HHs** faced shortage of water during any time of the year.

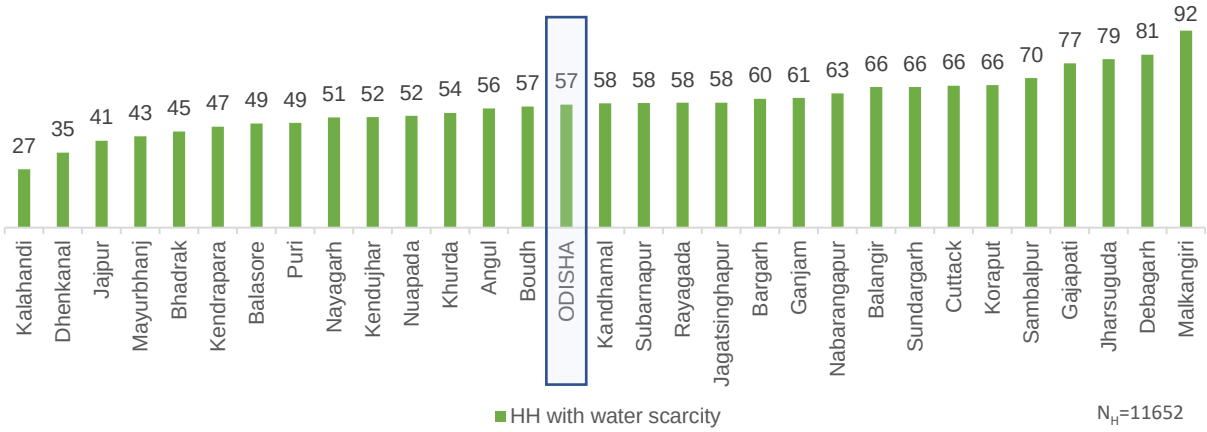
Figure 35:Households who faced water scarcity



F. Households with coping mechanism during scarcity of water

57% HHs reported having some mechanism to cope with scarcity of water.

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

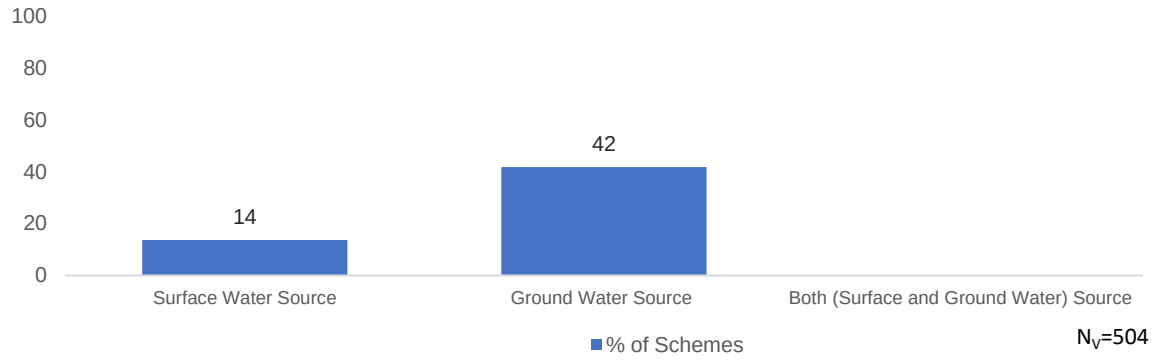


3.5. Source sustainability at the village level

Schemes based on surface and ground water

14% of schemes reported to be based on surface water source while **42% of schemes** reported to based of ground water sources

Figure 37: Schemes based on water source in village

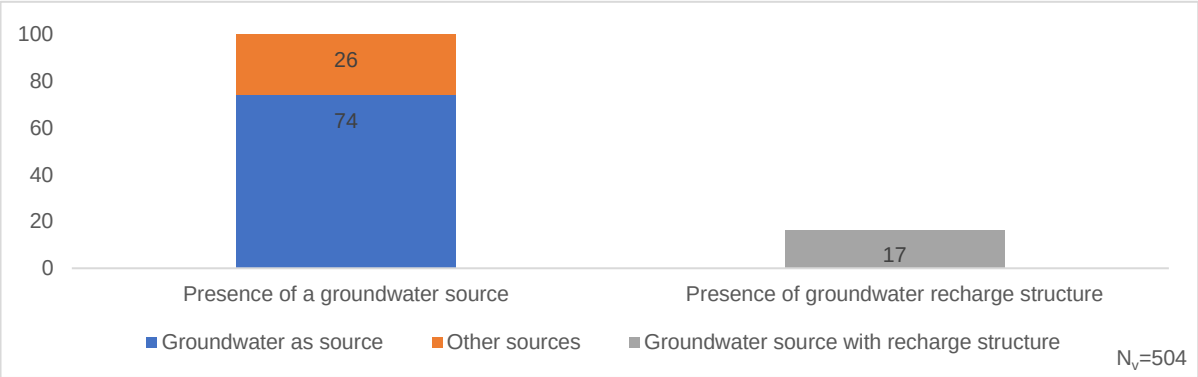


**'Surface Water Source' is Stream, Spring, Glacier, River, lake, pond etc. and Groundwater Source is open well, borewell, tube well, handpump, spring, etc.*

Villages reported having presence of a groundwater source

In the state, **74 percent villages** reported the presence of groundwater sources like improved dug wells and borewells. Out of which, 17 percent of villages reported (i.e., 84 villages) reported having a recharge structure.

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

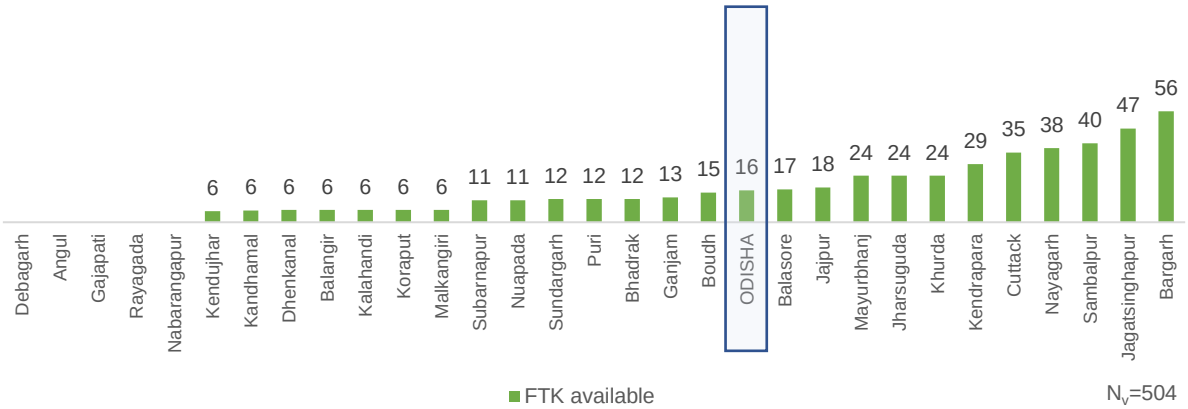


3.6. Water quality monitoring and surveillance in the villages

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

With regards to water quality testing in the village by VWSC, 16 percent villages in the state reported having available field test kits. Bargarh reported 56 percent villages having available field test kits for water quality testing, while Debagarh, Angul,Gajapati, Rayagada, and Nabarangapur reported 0 percent.

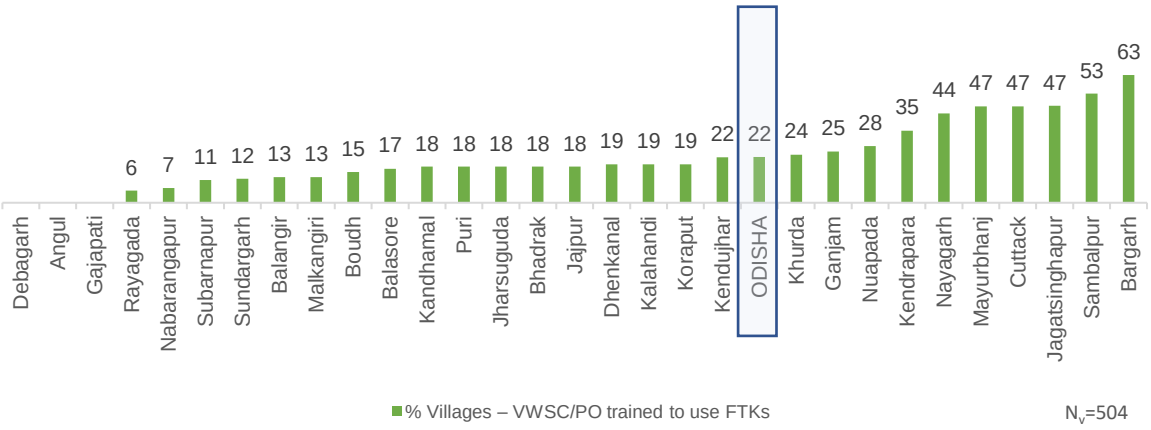
Figure 39: Availability of field test kits with VWSC/ Pani Samiti



B. VWSC/Pani Samiti trained to use field test kits

Overall, **22 percent 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. Bargarh reported 63 percent VWSC/Pani Samiti or pump operator trained to use field test kits while Debagarh, Angul and Gajapati reported no such villages.

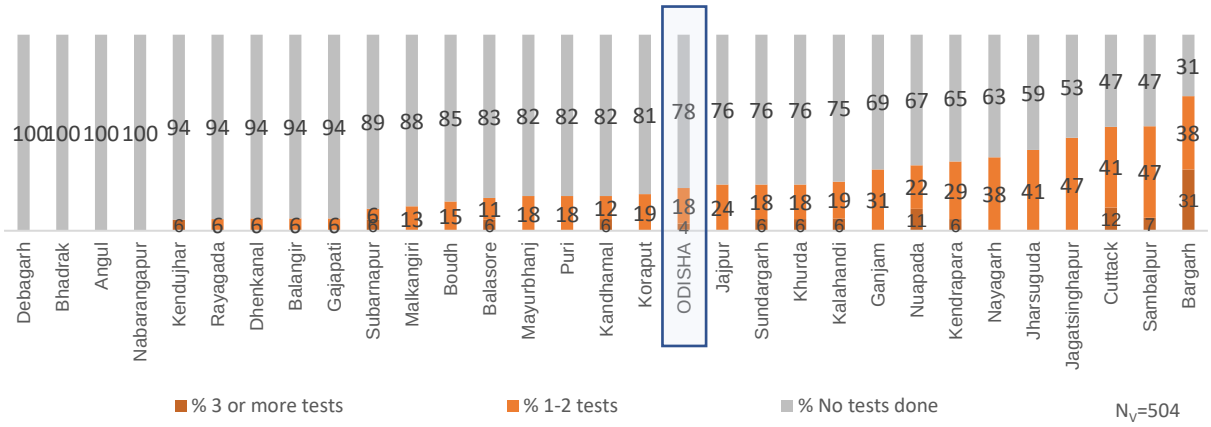
Figure 40: Persons trained to use field test kits



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

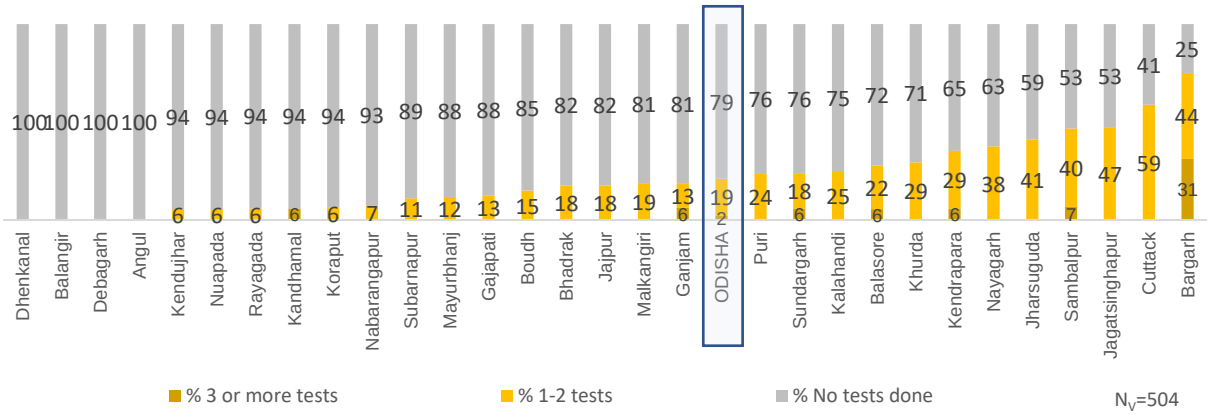
Across the state, about one-twentieth of the total sampled villages (4 percent) reported that the quality of water (at different points in the respective villages) was checked at least three times using FTKs in last one year. Among the districts, Bargarh had the highest proportion of such villages, wherein 31 percent of its villages reported using FTKs three or more times in last one year.

Figure 41: Frequency of testing using FTK in villages



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

Figure 42: Frequency of lab testing

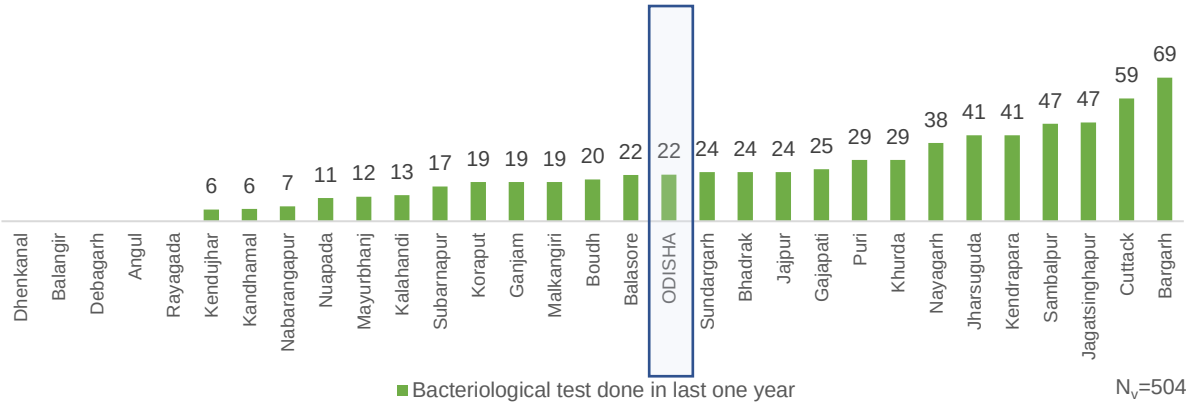


Across the state, 2% of the total sampled villages reported that the quality of water (at different points in the respective villages) was checked at least three times through laboratories in last one year. Among the districts, Bargarh had the highest proportion of such villages, wherein 31 percent of 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, **22 percent villages** in the state reported having bacteriological test done in the last one year.

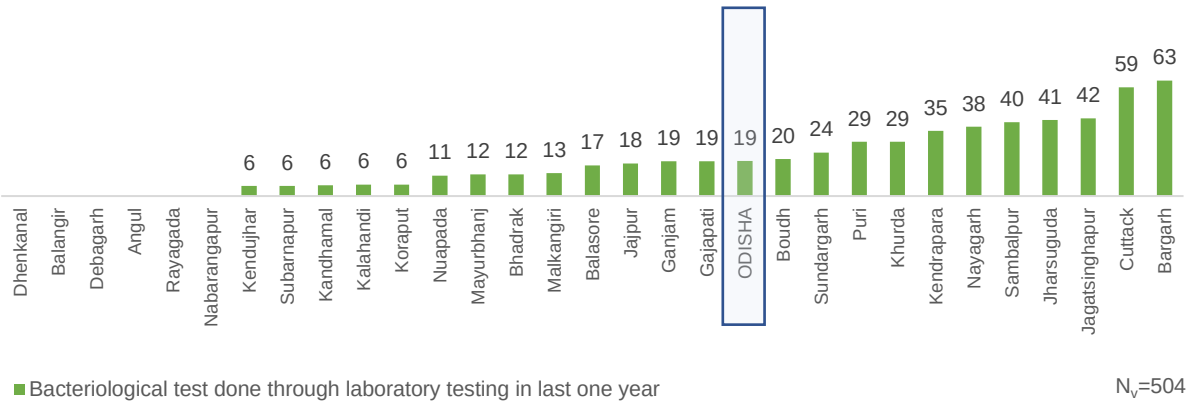
Figure 43: Percent villages in which Bacteriological test was done in the last one year



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 19 percent of sampled villages. 63 percent sampled villages from the district Bargarh reported to have had bacteriological tests done through laboratories in last one year.

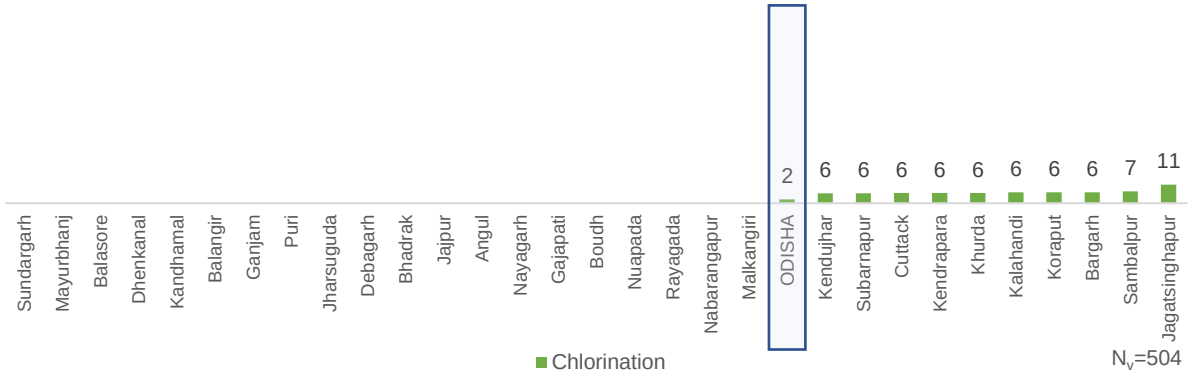
Figure 44: Bacteriological test done through laboratory testing in the last one year



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

More than **2 percent villages** reported that there is availability of chlorination mechanism in the village but during onsite testing of water at household level only 11 percent households tested to have for presence of chlorine.

Figure 45: Villages having a mechanism for chlorination

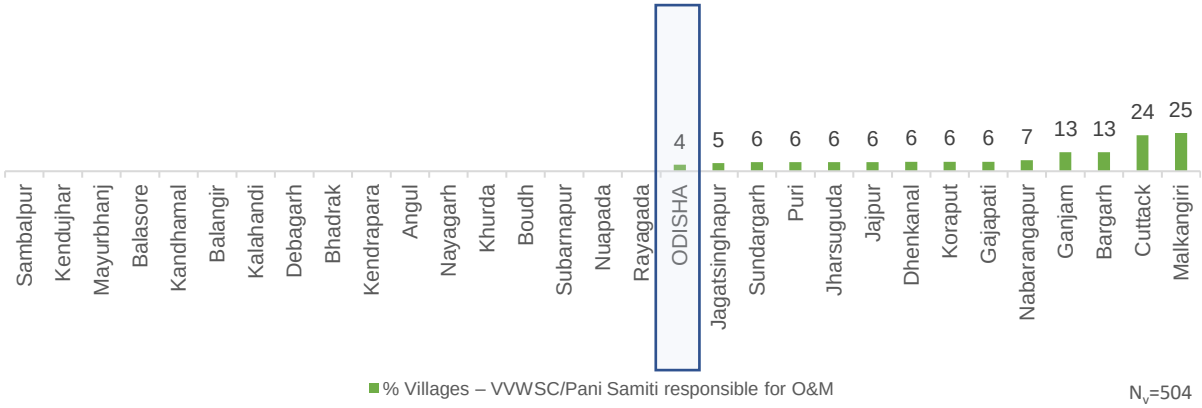


3.7. Management of water service delivery at village level

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

In the state, **4 percent villages** that have VWSC/Pani Samiti reported to be responsible for operation and maintenance of PWS. 17 districts reported that VWSC/Pani Samiti are not responsible for operation and maintenance of PWS.

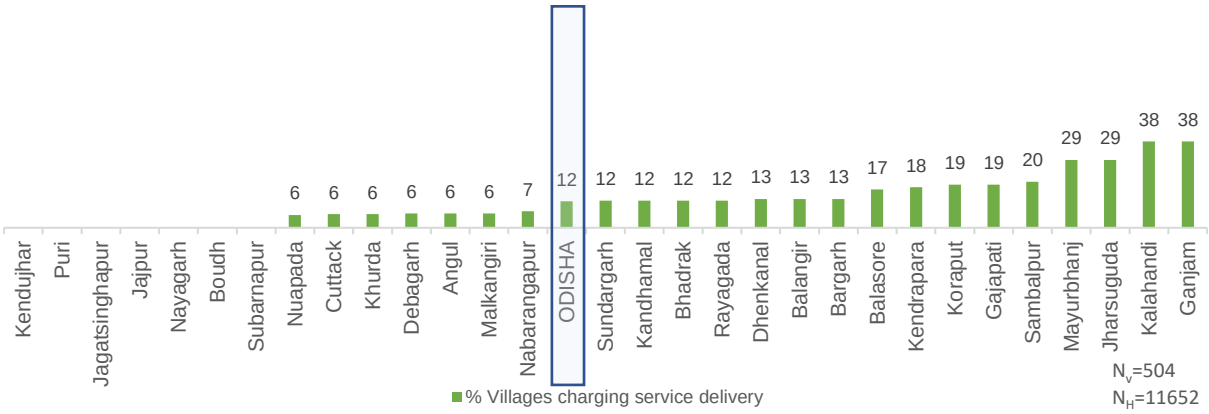
Figure 46: VWSC/Pani Samiti responsibility for O&M of PWS schemes



B. Villages levying water service delivery charges from households

Overall, **12 percent of villages** in the state levy charge for water service delivery to households whereas **13 percent HHs** reported paying water service delivery charges at the households.

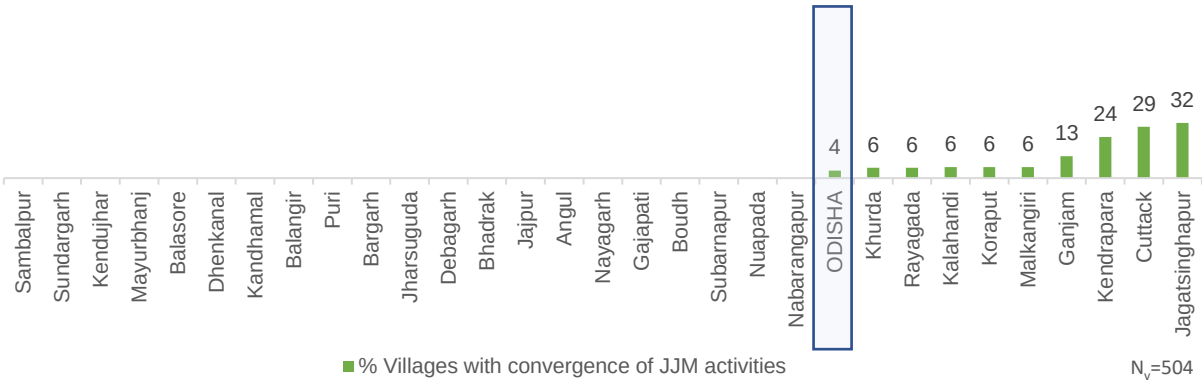
Figure 47: Villages levying water service delivery charges from households



C. Convergence of JJM activities with other schemes in villages

In the state, only **4 percent 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.

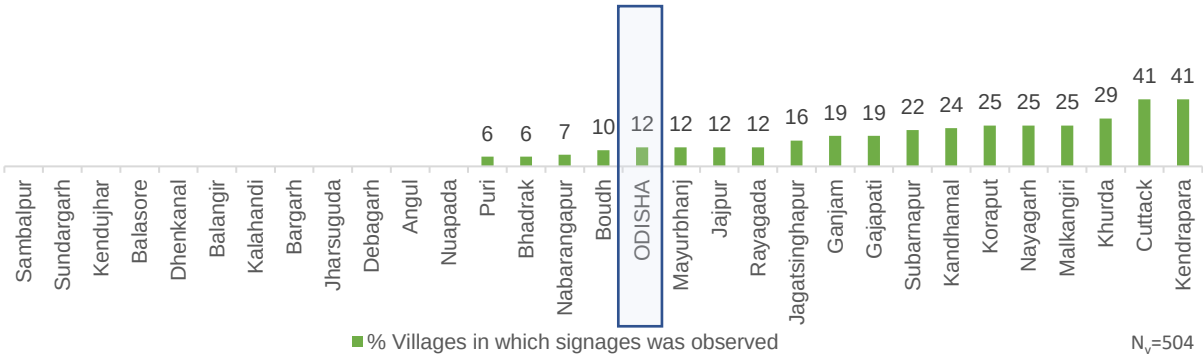
Figure 48: Village reported convergence of JJM activities with other schemes in the village



D. Villages where signages

Signages about JJM were observed in 12 percent of the sampled villages. District Kendrapara had the highest proportion of villages where signages were observed (41 percent).

Figure 49: Villages in which signages about JJM was observed

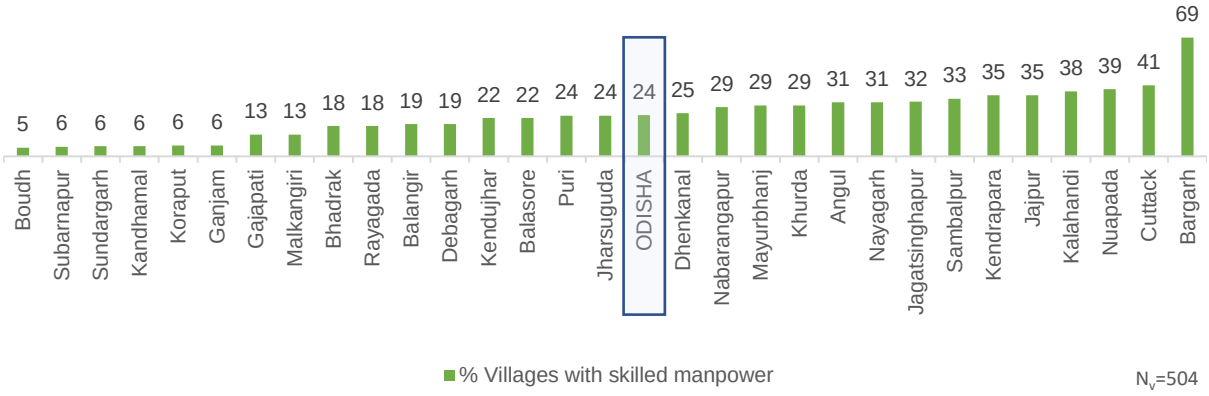


3.8. Status of Operation & Maintenance

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

Across the state, **24 percent villages** in the reported having identified skilled manpower for O&M of PWS schemes, the most reported to be in Bargarh (69 percent) and the least in Boudh (5 percent)

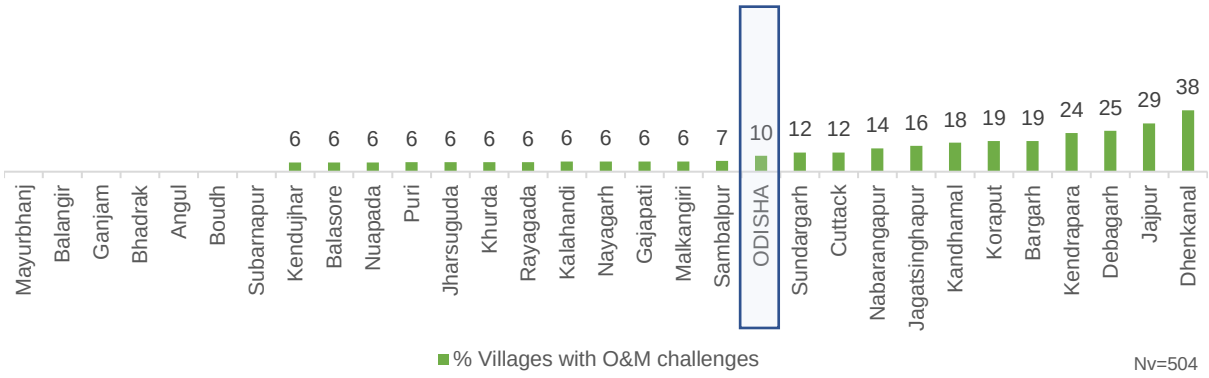
Figure 50: Villages reported having skilled manpower for O&M of PWS schemes



B. Villages with O&M challenges

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

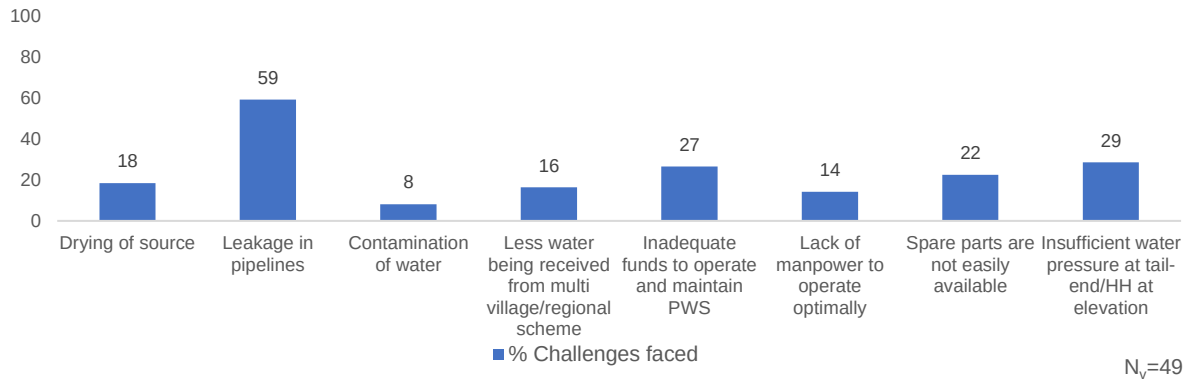
Figure 51: Villages reported having faced O&M challenge



C. Details of challenges faced

Out of the 10 percent of villages that had faced challenges with respect to O&M of PWS schemes (49 villages), 'leakage in pipelines' was attributed the most – at 59 percent.

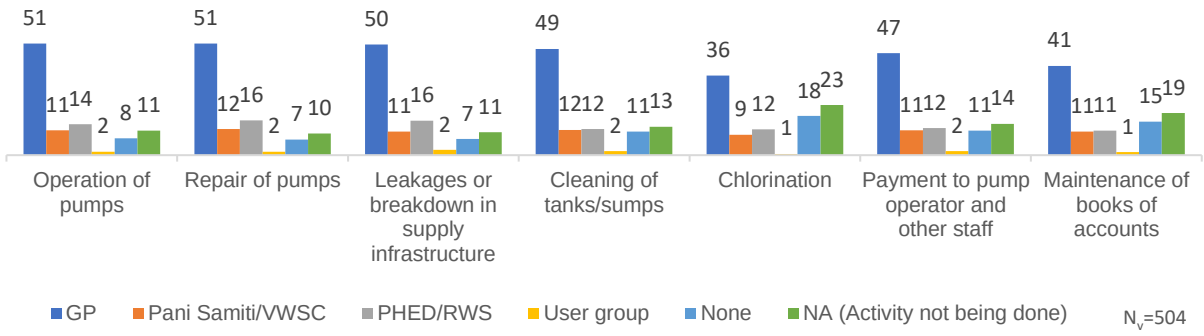
Figure 52: Details of O&M challenges faced by village



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.

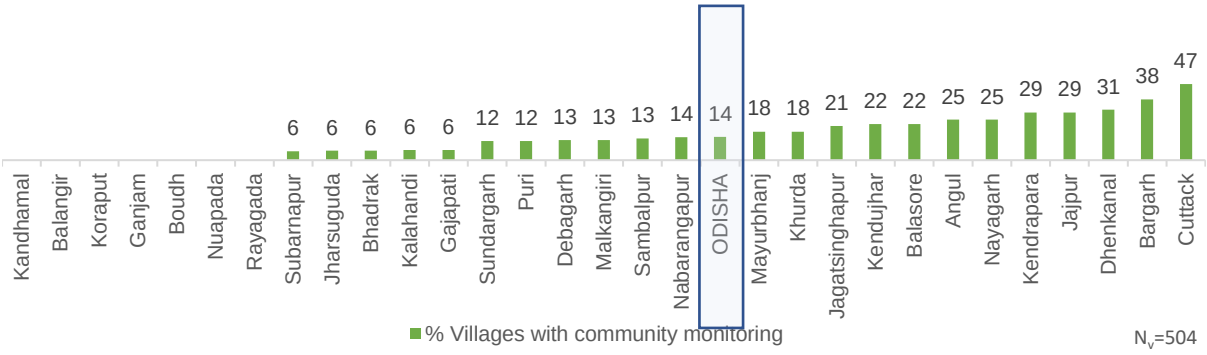
Figure 53: Different bodies responsible for O&M



E. Villages with community level monitoring of water wastage

14 percent of villages in the state reported to have community level monitoring of water wastage.

Figure 54: Villages reported having community level monitoring of water wastage

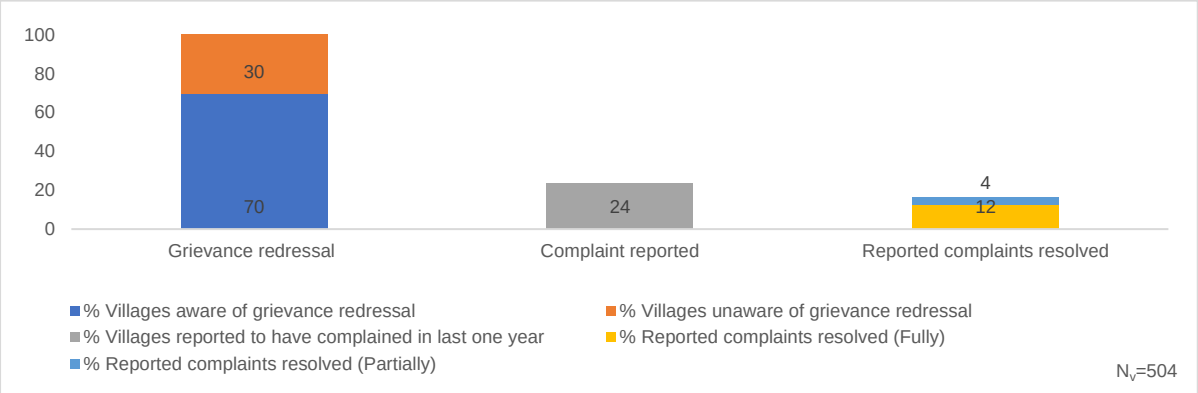


3.9. Status of service delivery related grievances and redressal

A. Village level

Grievance redressal at village

Figure 55: Reporting of grievance redressal at village level

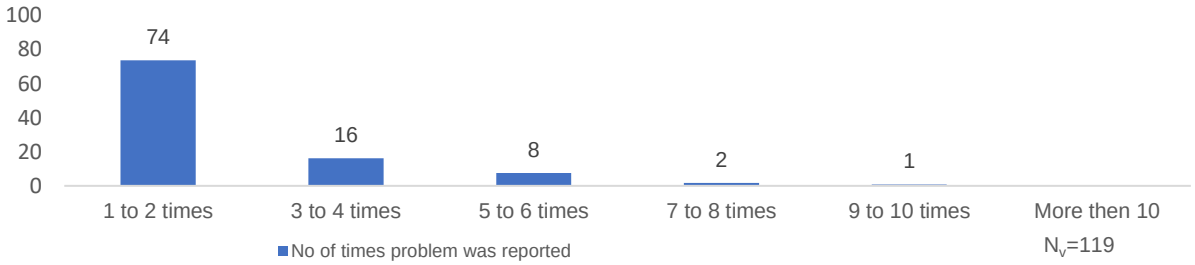


In the state, **70 percent of villages** reported that they are aware of any grievance redressal mechanism, but only 24 percent HHs have reported a complaint in the last one year amongst which 12 percent reported that the complaints are fully resolved while 4 percent of complaints have been partially resolved.

Problem reported in last 1 year

Among the villages who reported a complaint (i.e. 49 villages), none of the villages have reported a complaint more than 10 times in the last one year, while 74 percent reported a complaint at least once or twice.

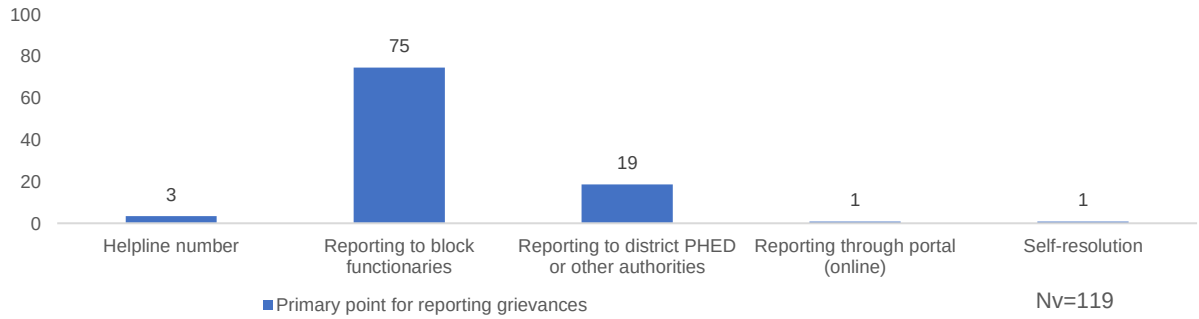
Figure 56: Number of times villages have reported grievance in last 1 year



Primary points for reporting grievances and key problems

Among those who reported complaint (i.e., 24% HHs, 119 villages), **75% of villages** reported that they report their grievances to **block functionaries** beside other reporting-points

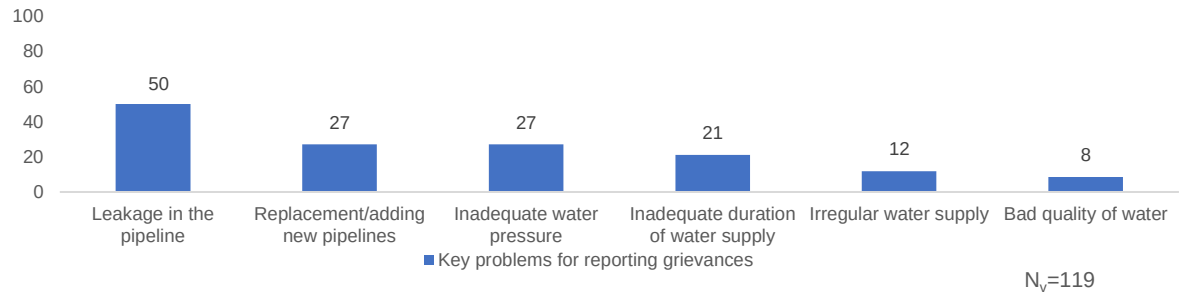
Figure 57: Primary points for reporting grievances by village



Key problems for reporting grievances

Overall, among those who reported complaint (i.e., 24% HHs, 119 villages) **50% of villages** reported that **leakage in the pipeline** is their most encountered problem for reporting grievances

Figure 58: Key problems reported by village

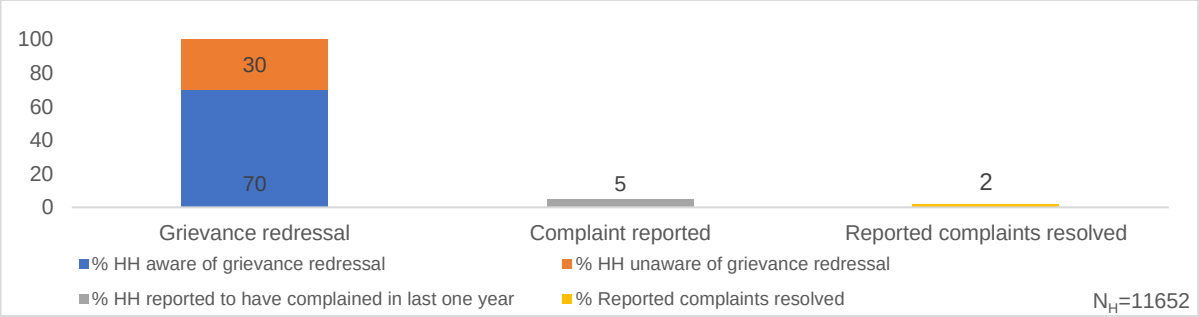


B. Household level

Awareness of grievance redressal at household

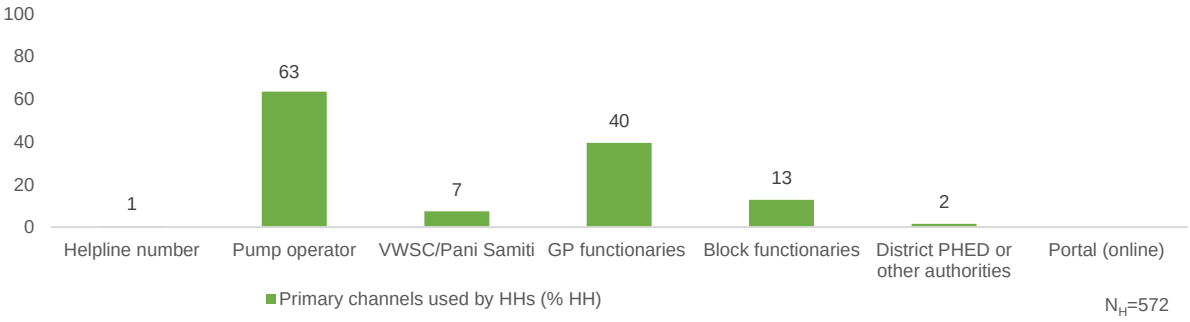
In the state, **70 percent of HHs** reported that they are aware of any grievance redressal mechanism w.r.t. HH tap water through PWS, but only 5 percent HHs have reported a complaint in the last one year and only 2 percent of complaints have been resolved.

Figure 59: Reporting of grievance redressal at household level



Primary channels for reporting grievances by households

Figure 60: Primary channels for reporting grievances by households

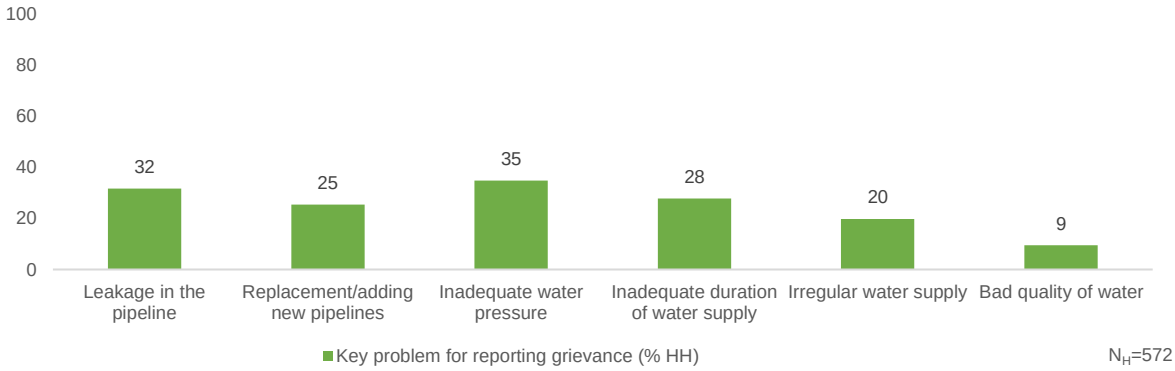


Among those who reported complaint as shown in the above graph (i.e., 5% HHs, 572 HHs), **63%** of the HHs reported their complaints to the **pump operators** beside other reporting-channels

Key problems for reporting grievances

Overall, among those who reported complaint (i.e., 5% HHs, 572 HHs) **35%** of the HHs that reported problems was of **inadequate water pressure** beside other problems

Figure 61: Key problems reported by households

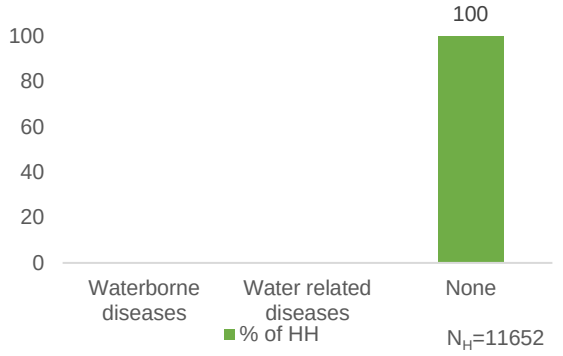


3.10. Perception of HHs on Outcome Indicators

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

Across the state only none of the HHs reported having an incidence(s) of water borne diseases in your household in last one year. The cases recorded were of Dysentery, Diarrhoea, Cholera and Typhoid

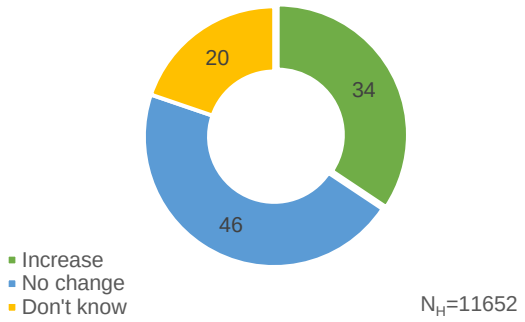
Figure 63: Household reported incidence of water borne diseases in last one year



B. Change in employment days since FHTC programmes/schemes

Since having a functional HH tap connection, 34% HHs across the state has reported that there has been a change in the no. of employment days of the adult HH members while 46% HHs reported no change

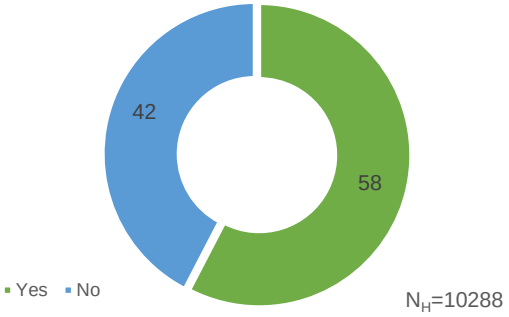
Figure 62: Household reported a change in employment days since FHTC programmes /schemes



C. Reduction in time and effort in collecting water

Out of the HHs reported (i.e. 10288) that female members used to fetch water before HH tap connection, 58% reported that post installation of HH tap connection it helped reduction of time and effort in collection of water

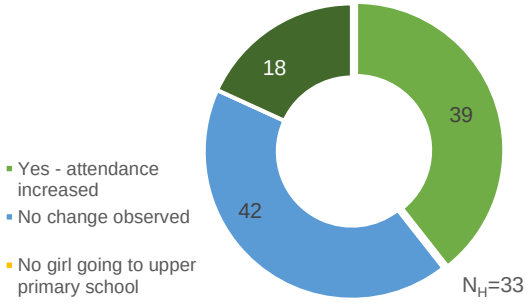
Figure 64: Households reported reduction in time and effort in collecting water



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

Across the state, 39% HHs reported that since having a functional HH tap connection the attendance of the girls going to schools increased, while 42% HHs reported no change in attendance which could possibly be an impact of shutting down of schools due to COVID-19 related lockdown during the survey

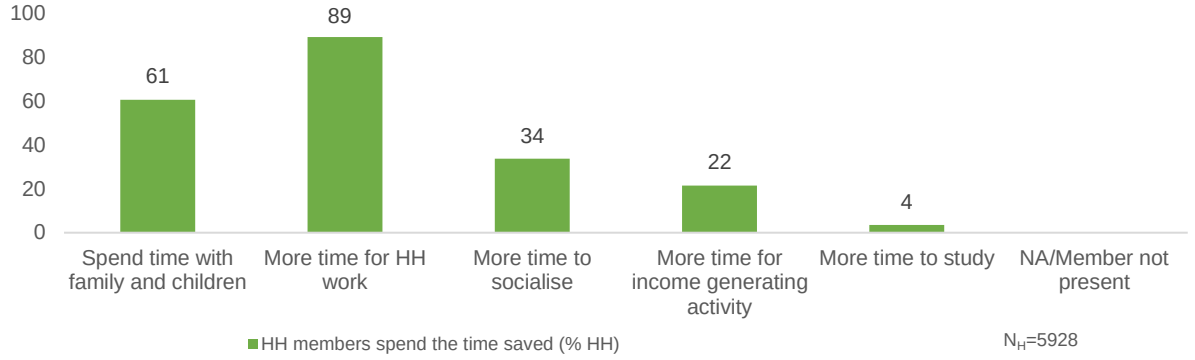
Figure 65: Households reported increase of attendance of girls going to upper primary school



E. Utilization of time saved by households post installation of HH 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 (89 percent).

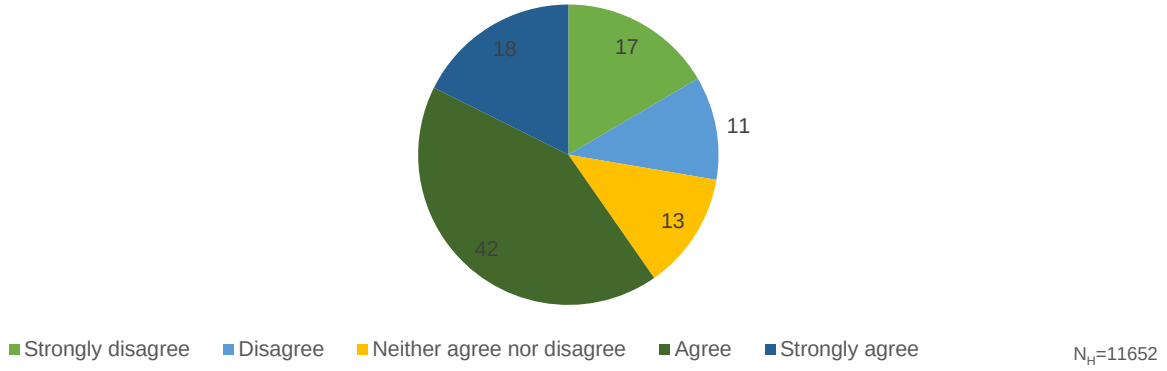
Figure 66: Utilization of time saved by households post installation of HH tap connection



F. Change in social status

Sense of pride and positive change in social status was reportedly realized by 60 percent of HHs post the installation of HH tap connections.

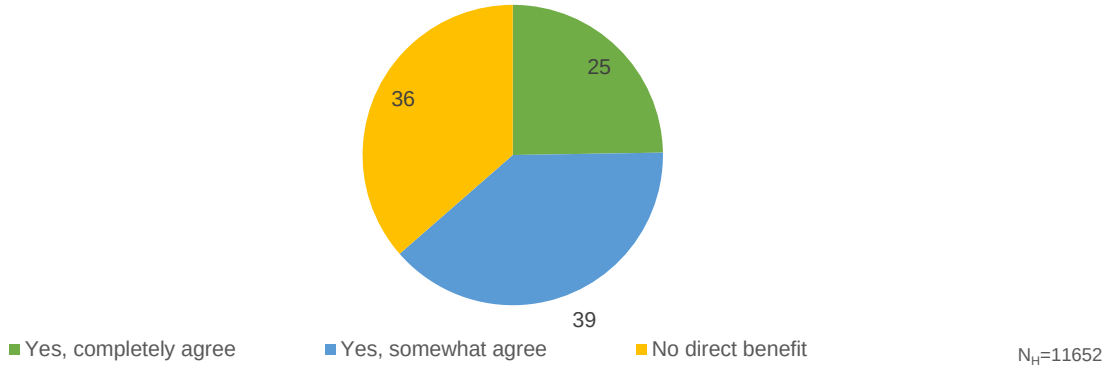
Figure 67: Households reported to have a positive change in social status



G. Direct benefits in terms of income due to FHTC

Across the state, 25 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 39 percent HHs reported being in partial agreement against the same.

Figure 68: 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

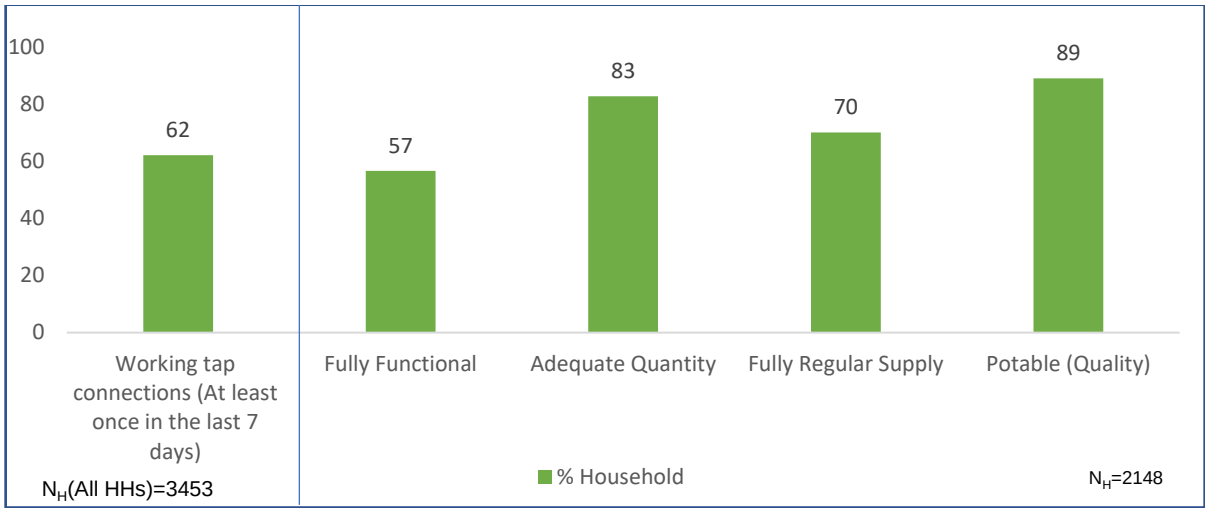
S. No.	Parameter (N_h=11652)		In %
1	Regularity		75.1
2	Overall quality		70.4
3	Colour		69.9
4	Taste		70.2
5	Odour		69.2

Note:
Base (N_v)=504 means all villages sampled and covered in Odisha state
Base (N_H)=11652 means all households sampled and covered across the 504 villages in Odisha state
Base (N_H)=7925 means all households sampled where water sample be collected across the 504 villages in Odisha state
Base (N_H)=10288 means all households sampled where female members used to fetch water before HH tap connection
Base (N_H)=33 means all households sampled that had adolescent girls as one of HH members

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

4.1. Overall Functionality (in %)

Figure 69: Functionality of HH tap connection for Har Ghar Jal districts



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

Please note: For Har Ghar Jal district, N_H=2148 implies all HHs where water was found on the day of the survey.

It has been found that 62 percent of the sampled HHs (N=3453) had working tap connections. 57 percent HHs in the state were found to have fully functional HH tap water connection. Moreover, more than 4 out of 5 households (83 percent) received adequate quantity (>=55 LPCD) of water supply and more than two-third received regular supply (70 percent) of water. The on-site testing and lab test results of the water indicates that more than 8 out of 10 (89%) sampled households in the state receive potable water.

Table No. 8: Quantity, Regularity, and Quality of FHTC for aspirational districts (%HH)

S. No.	District	Working tap connections (HHs which received water through FHTC at least once in the last 7 days) (% HH)	Fully functional (% HH)	Adequate Quantity (% HH)	Full Regular Supply (% HH)	Potable (Quality) (% HH)
1.	Debagarh					
2.	Jagatsinghapur	16	79	83	79	83
3.	Boudh	30	41	66	75	96
4.	Kendujhar	45	55	90	97	63
5.	Bhadrak	47	75	98	91	86
6.	Sundargarh	50	36	50	39	97
7.	Jajpur	50	0	92	100	0
8.	Balangir	56	100	100	100	100
9.	Koraput	59	54	89	83	80
10.	Jharsuguda	60	67	100	67	100
11.	Mayurbhanj	61	89	96	93	100
12.	**ODISHA**	**62**	**57**	**83**	**70**	**89**
13.	Cuttack	64	35	72	45	92
14.	Nayagarh	66	77	95	81	100
15.	Kandhamal	67	51	81	63	100
16.	Ganjam	67	72	81	87	100

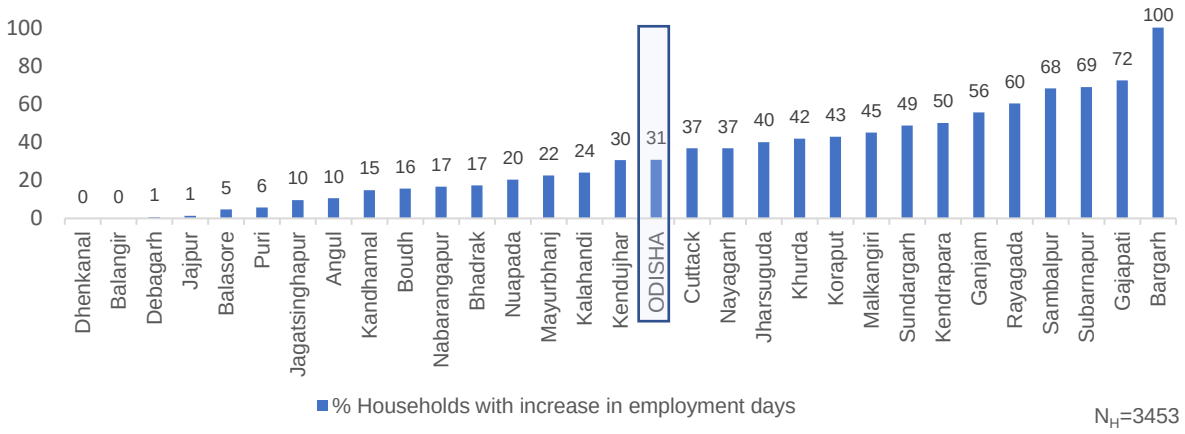
Table No. 8: Quantity, Regularity, and Quality of FHTC for aspirational districts (%HH)						
S. No.	**District**	**Working tap connections (HHs which received water through FHTC at least once in the last 7 days) (% HH)**	**Fully functional (% HH)**	**Adequate Quantity (% HH)**	**Full Regular Supply (% HH)**	**Potable (Quality) (% HH)**
17.	Angul	67	31	32	32	68
18.	Nabarangapur	67	72	100	72	100
19.	Khurda	67	61	76	82	100
20.	Balasore	72	43	88	67	70
21.	Puri	75	42	68	64	100
22.	Sambalpur	75	20	87	28	81
23.	Nuapada	75	65	88	66	100
24.	Malkangiri	79	43	85	55	83
25.	Subarnapur	83	66	79	86	100
26.	Kendrapara	86	69	100	75	93
27.	Dhenkanal	100	0	53	0	100
28.	Kalahandi	100	74	96	76	98
29.	Bargarh	100	97	100	100	97
30.	Gajapati	100	38	77	52	79
31.	Rayagada	100	65	88	75	94
# Potable water has been considered basis testing of water samples through laboratory tests for physical, chemical, and bacteriological as given in Table 5 parameters (within acceptable/ permissible range) and onsite testing of pH. The details of laboratory test are mentioned in the table given above in the glossary.						

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

A. Change in employment days since FHTC programmes/ schemes

Across the state, less than one-third of the sampled households reported that employment days increased since the installation of FHTC.

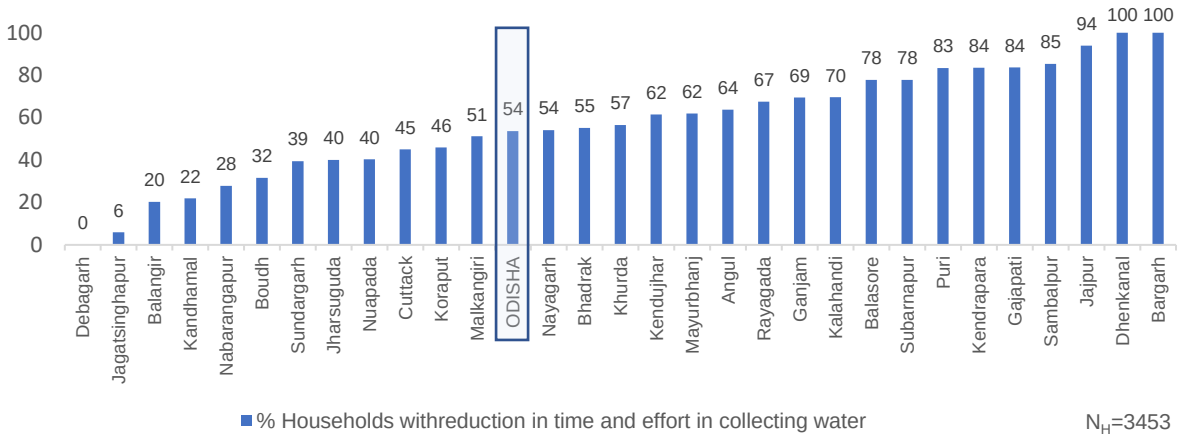
Figure 70: Household reported a change in employment days since FHTC programmes /schemes in Aspirational districts



B. Reduction in time and effort in collecting water

Similarly, about 54 percent of the sampled households also reported that the effort and time in collecting water reduced after installation of FHTC.

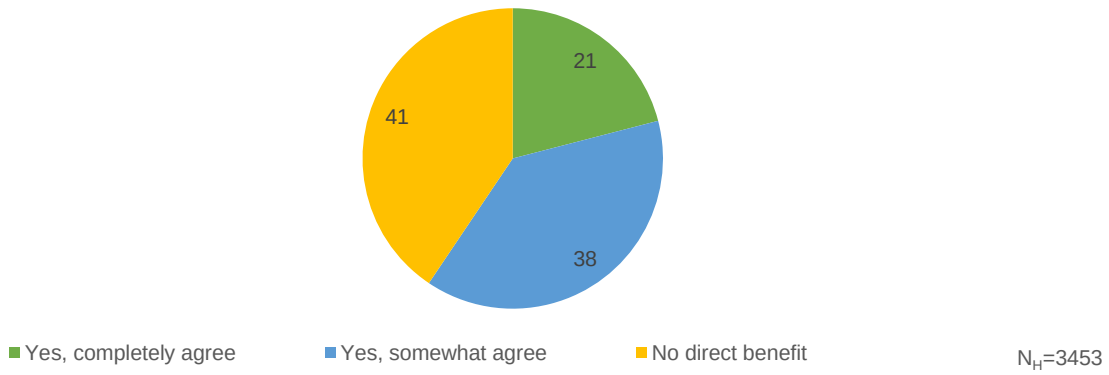
Figure 71: Households reported reduction in time and effort in collecting water in Har Ghar Jal districts



4.3. Direct benefits in terms of income due to FHTC

Across the nation, 21 percent 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 38 percent reported being in partial agreement against the same.

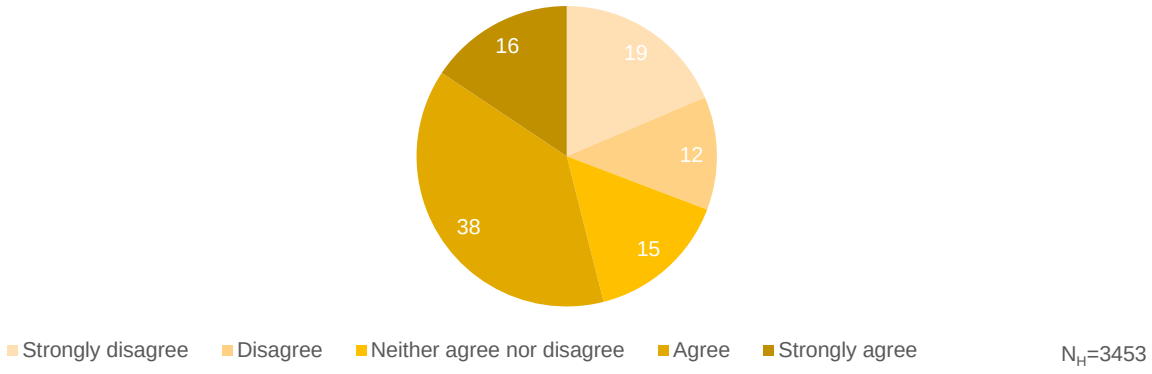
Figure 72: Households reported to have received direct benefits in terms of income due to FHTC in Har Ghar Jal districts



4.4. Change in social status

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

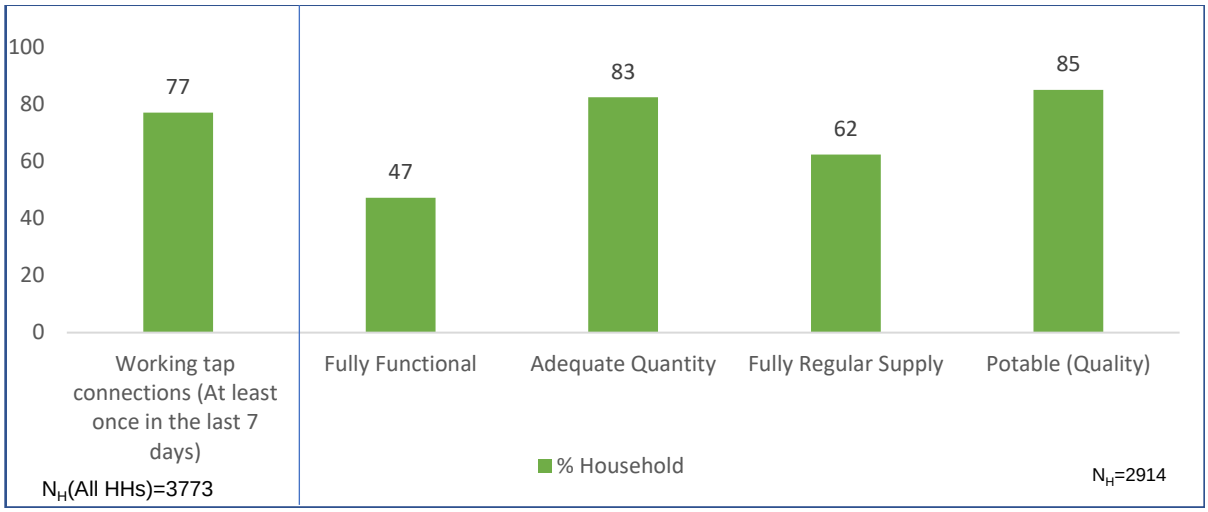
Figure 73: Households reported to have a positive change in social status in Har Ghar Jal districts



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

5.1. Overall Functionality (in %)

Figure 75: Functionality of HH tap connection for aspirational districts



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

Please note: For aspirational district, N_H=2914 implies all HHs where water was found on the day of the survey.

It has been found that 77 percent of the sampled HHs (N=3773) had working tap connections. 47 percent HHs in the state were found to have fully functional HH tap water connection. Moreover, more than 4 out of 5 households (83 percent) received adequate quantity (>=55 LPCD) of water supply and more than 3 out of 5 received regular supply (62 percent) of water. The on-site testing and lab test results of the water indicates that more than 8 out of 10 (85%) 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.	Balangir	60	60	95	63	100
2.	Dhenkanal	67	9	44	22	87
3.	Kalahandi	67	47	82	61	85
4.	Koraput	76	33	90	80	44
5.	**ODISHA**	**77**	**47**	**83**	**62**	**85**
6.	Malkangiri	80	35	83	42	91
7.	Nuapada	81	60	90	64	100
8.	Nabarangapur	82	66	99	69	99
9.	Kandhamal	86	66	82	81	99
10.	Rayagada	88	58	81	72	93
11.	Gajapati	90	34	80	63	57

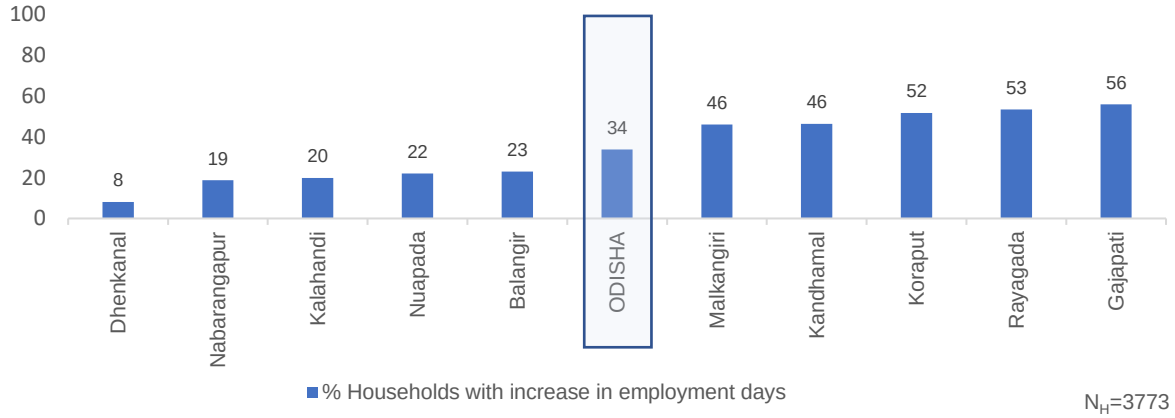
Potable water has been considered basis testing of water samples through laboratory tests for physical, chemical, and bacteriological as given in Table 5 parameters (within acceptable/ permissible range) and onsite testing of pH. The details of laboratory test are mentioned in the table given above in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

5.2. Perception of HHs from aspirational districts on Outcome Indicators

A. Change in employment days since FHTC programmes/ schemes

Only around 34 percent of the households in aspirational districts reported increase in employment days since installation of FHTC.

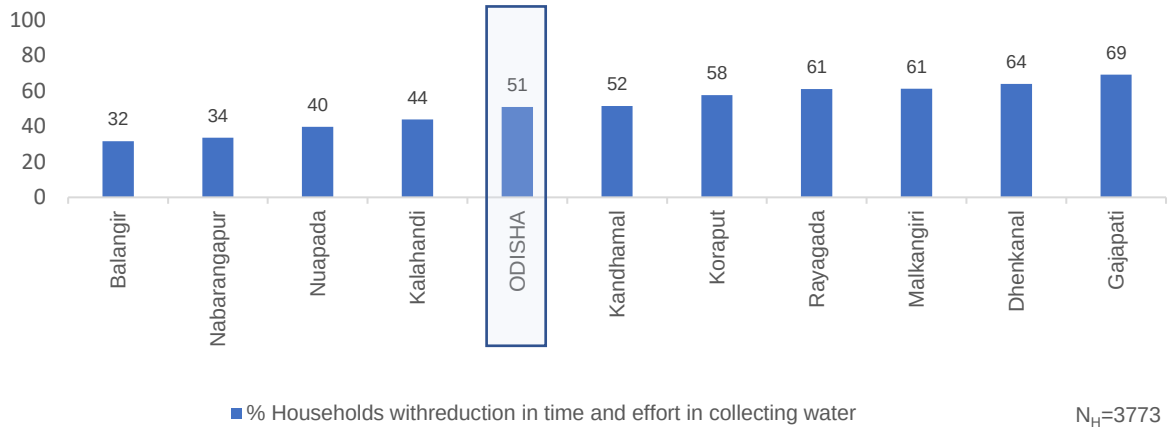
Figure 76: Household reported a change in employment days since FHTC programmes /schemes in Aspirational districts



B. Reduction in time and effort in collecting water

Only around 51 percent of the households in aspirational districts reported reduction in time and effort in collecting water.

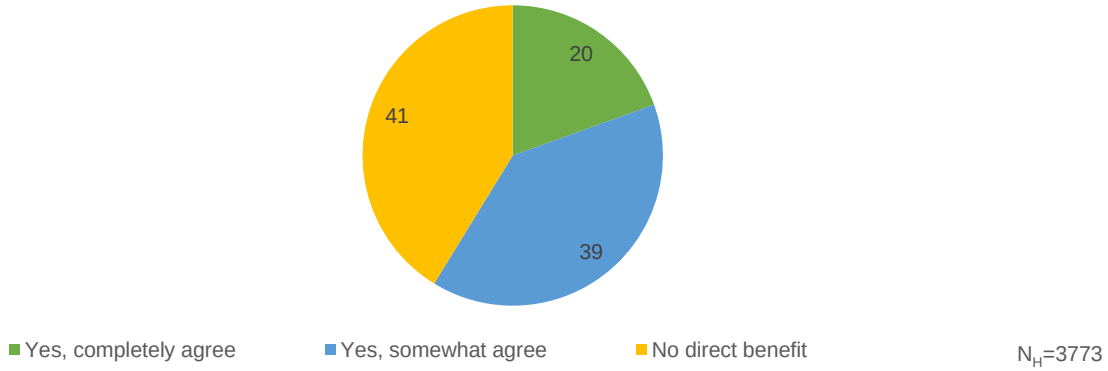
Figure 77: Households reported reduction in time and effort in collecting water in Aspirational districts



5.3. Direct benefits in terms of income due to FHTC

Across the state, 20 percent 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 39 percent reported being in partial agreement against the same.

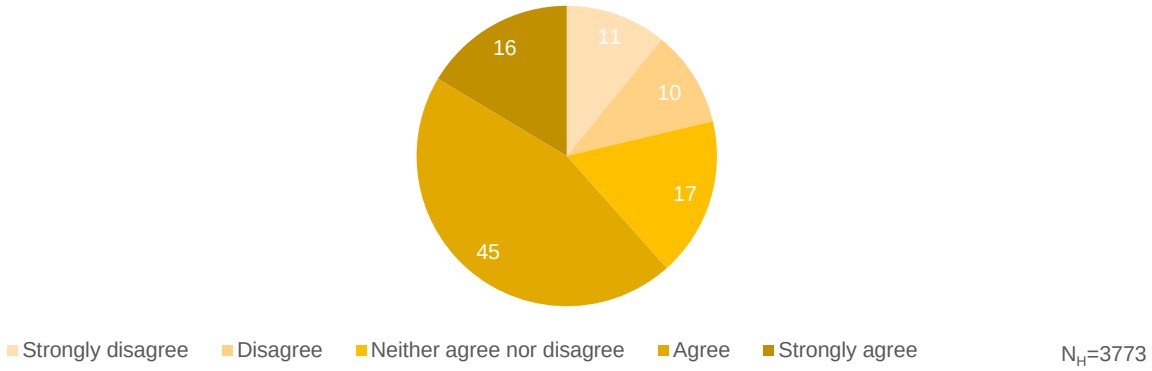
Figure 78: Households reported to have received direct benefits in terms of income due to FHTC in Aspirational districts



5.4. Change in social status

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

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



6. Annexure

Table No. 10: List of replaced villages

S. No.	District Name	Village Name	Status of the Scheme (No Scheme/Replaced & Defunct)	Remarks
1	Sambalpur	Jamadarpali	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Rani-Khinda. Scheme found to be functional in replacement village
2	Sambalpur	Kultanuapalipali	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Labdera. Scheme found to be functional in replacement village
3	Sambalpur	Dhapani	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Katar-Baga. Scheme found to be functional in replacement village
4	Sambalpur	Bharatapur	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Kandtaila. Scheme found to be functional in replacement village
5	Sambalpur	Chudapudug	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Baniabandh. Scheme found to be defunct in replacement village
6	Sundargarh	Gopalpur	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Jhupurunga. Scheme found to be functional in replacement village
7	Sundargarh	Chatakpur	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Pandiapali. Scheme found to be defunct in replacement village
8	Sundargarh	Kutunia	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Laing. Scheme found to be functional in replacement village
9	Sundargarh	Rangamati	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Kusumdega. Scheme found to be defunct in replacement village
10	Sundargarh	Samardari	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Gombadihi. Scheme found to be defunct in replacement village
11	Sundargarh	Badraksi	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Kusumdihi. Scheme found to be defunct in replacement village
12	Sundargarh	Kamanda	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Andhari. Scheme found to be defunct in replacement village
13	Kendujhar	Brahmanideo	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Murusuan. Scheme found to be defunct in replacement village
14	Mayurbhanj	Sankucha	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Kanchanpal. Scheme found to be functional in replacement village
15	Balasore	Kalikapur	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Baradiha. Scheme found to be defunct in replacement village
16	Dhenkanal	Sarakhia	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Tentuliapatana. Scheme found to be defunct in replacement village

Table No. 10: List of replaced villages

S. No.	District Name	Village Name	Status of the Scheme (No Scheme/Replaced & Defunct)	Remarks
17	Dhenkanal	Bampa	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Naukiari. Scheme found to be functional in replacement village
18	Kandhamal	Katingia	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Tiangia. Scheme found to be functional in replacement village
19	Kalahandi	Boden	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Dabjharan. Scheme found to be functional in replacement village
20	Kalahandi	Kuturachuan	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Baijalpur. Scheme found to be functional in replacement village
21	Puri	Ketakudi	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Rebananuagaon. Scheme found to be defunct in replacement village
22	Puri	Maradarajpur	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Goudaranapada. Scheme found to be defunct in replacement village
23	Puri	Kerandipur	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Alakunda. Scheme found to be defunct in replacement village
24	Puri	Kundhei	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Praharajpur. Scheme found to be functional in replacement village
25	Puri	Badaola	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Siso. Scheme found to be defunct in replacement village
26	Puri	Kulasekharpatna	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Malibarahai. Scheme found to be functional in replacement village
27	Puri	Gadasanput	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Gadisagada. Scheme found to be functional in replacement village
28	Puri	Bijipur	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Parajapada. Scheme found to be functional in replacement village
29	Bargarh	Jhulpiapali	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Laumunda. Scheme found to be functional in replacement village
30	Bargarh	Ainlapali	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Kudopali. Scheme found to be functional in replacement village
31	Bargarh	Chhindrapali	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Ghens. Scheme found to be functional in replacement village
32	Bargarh	Sardhapali	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Talsirgida. Scheme found to be functional in replacement village
33	Jharsuguda	Bhursimal	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Sialrama. Scheme found to be functional in replacement village

Table No. 10: List of replaced villages

S. No.	District Name	Village Name	Status of the Scheme (No Scheme/Replaced & Defunct)	Remarks
34	Jharsuguda	Paikpada	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Raghunathpali. Scheme found to be functional in replacement village
35	Jharsuguda	Sandhurian	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Sahaspur. Scheme found to be functional in replacement village
36	Jharsuguda	Renkuli	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Chantipali. Scheme found to be defunct in replacement village
37	Jharsuguda	Remda	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Chuikhunch. Scheme found to be defunct in replacement village
38	Jharsuguda	Dalgaon	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Parmanpur. Scheme found to be functional in replacement village
39	Jharsuguda	Baghrachaka	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Rajpur. Scheme found to be functional in replacement village
40	Jharsuguda	Loising	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Lahandabud. Scheme found to be functional in replacement village
41	Debagarh	Tainsira	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Petpura. Scheme found to be defunct in replacement village
42	Debagarh	Bideibadakudar	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Rajamunda. Scheme found to be defunct in replacement village
43	Debagarh	Tusula	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Sunapasi. Scheme found to be defunct in replacement village
44	Kendrapara	Maradpur	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Gagua. Scheme found to be functional in replacement village
45	Kendrapara	Chhachina	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Sridharpur. Scheme found to be functional in replacement village
46	Jagatsinghapur	Sindol	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Arada. Scheme found to be defunct in replacement village
47	Jagatsinghapur	Garam	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Baradia. Scheme found to be defunct in replacement village
48	Jajpur	Dhanmandal	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Sahupada. Scheme found to be defunct in replacement village
49	Jajpur	Rukutipat	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Ramchandrapur. Scheme found to be functional in replacement village
50	Jajpur	Kabatabandha	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Kadamapal. Scheme found to be defunct in replacement village

Table No. 10: List of replaced villages

S. No.	District Name	Village Name	Status of the Scheme (No Scheme/Replaced & Defunct)	Remarks
51	Angul	Kundanali	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Natidi. Scheme found to be defunct in replacement village
52	Angul	Phuljhari	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Khalari. Scheme found to be defunct in replacement village
53	Angul	Siaria	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Purunapani. Scheme found to be defunct in replacement village
54	Nayagarh	Tendabadi	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Bitalgadia. Scheme found to be functional in replacement village
55	Nayagarh	Bhandaribari	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Narajpada. Scheme found to be functional in replacement village
56	Nayagarh	Chaupalli	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Giridipatana. Scheme found to be defunct in replacement village
57	Nayagarh	Ladukeswarprasad	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Sudranuapali. Scheme found to be defunct in replacement village
58	Nayagarh	Nimani	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Badabar. Scheme found to be functional in replacement village
59	Nayagarh	Jaharkote	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Mahulia. Scheme found to be functional in replacement village
60	Nayagarh	Gamei	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Ballabhapur. Scheme found to be functional in replacement village
61	Khurda	Gurupada	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Gotapali. Scheme found to be defunct in replacement village
62	Nuapada	Ghotsar	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Pasamara. Scheme found to be defunct in replacement village
63	Nuapada	Paraskhol (Kala)	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Khaliapani. Scheme found to be functional in replacement village
64	Nabarangapur	Pujariguda	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Baidapada. Scheme found to be defunct in replacement village
65	Nabarangapur	Chakamal	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Patramunda. Scheme found to be functional in replacement village
66	Nabarangapur	Chattiguda	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Dhumarpada. Scheme found to be functional in replacement village
67	Malkangiri	Kangurukonda	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Arnamala. Scheme found to be functional in replacement village

Table No. 10: List of replaced villages

S. No.	District Name	Village Name	Status of the Scheme (No Scheme/Replaced & Defunct)	Remarks
68	Jajpur	Sahapada	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Betanda. Scheme found to be functional in replacement village
69	Nayagarh	Khalipatana	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Singhapada. Scheme found to be functional in replacement village