



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



STATE REPORT: BIHAR
SURVEY DURATION: FEBRUARY TO APRIL 2022

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Abbreviations

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

Glossary

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

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

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

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

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

12. **Sampling** – Selection of a subset of individuals from within a statistical population to estimate water service delivery among the population. In the current study, households have been sampled to estimate the representation of the village and subsequently of the district as well as of the state.
13. **Types of schemes:** Following are the piped water supply schemes that were assessed
 - 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 Bihar lies in the eastern part of India and has a population of 10,40,99,452 (Census 2011). It has 38 districts and 39456 villages, and 37977 villages have PWS schemes. The state is yet to achieve the Har Ghar Jal status. A total of 812 villages, across all districts, and 16404 households were randomly sampled for the survey, and additionally, water samples from 318 public institutions were tested.

In the assessment among sampled villages, 44% of villages have only one scheme, 30% of villages have 2-3 schemes, and 25% of villages have 4 and more schemes. Mostly all schemes across the state were found functional.

At the state level, 89% of the HHs were satisfied with the regularity of the supply, 88% with the quality of the water supplied, 90% with the colour of the water supplied, and 89% with the taste of the supplied tap water.

Overall functionality status of Bihar

At the state level, 89% of HHs received water on the day of the survey. While 78% of the HHs were found to have fully functional tap water connections within the premises. Out of which 97% received an adequate quantity of water, 84% reported receiving a fully regular supply of water, and 94% HHs received potable water.

It was found that more than 97% of households received water all 7 days a week and 33% received at least 1 to 2 days, while 1% of the HHs received water 5 to 6 days a week. The average duration of water supply across the state was reported to be 4 hours per day.

In Bihar, 20% of the villages have reported that water is directly supplied to the households and the remaining 80% 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 Bihar, 14861 samples of water were submitted, and 14689 were tested at the labs. The turnaround time of testing of water sample was more than 48 hours in most cases. Given this feedback, it can be conferred that these labs have limited scope to take up samples from the general public at large on a regular basis. The different quality parameters of the collected water samples that were tested were turbidity, total hardness, total alkalinity, chloride, iron, nitrate, sulphate, total dissolved solids, bacteriological test, arsenic, and fluoride.

Residual chlorine was found within the permissible limit only in 5% of the HHs. The percentage was relatively higher in Health Facilities (more than 10%), wherein there is a possibility of additional chlorine being added locally for the purification of water. Even if 87% of samples passed in bacteriological parameter the RC was found only in 13%, which means the protection against the risk of bacteriological contamination from source to point of consumption is not provided to HHs. A monitoring system to ensure the correct dosing of chlorine in the pipe water supply system is necessary for assuring potable water.

Out of the 16404 HHs sampled for the FHTC assessment, a water quality test was carried out in 14552 due to the non-availability of water in 11% HHs on the day of the survey. pH was found within the acceptable limit in 98% of households. Among the public institution, pH was found in the acceptable limit of more than 95% in all the public institutions.

13% of villages in the state reported having available field test kits. And almost 14% 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 13% of villages in the state reported having a VWSC or a Pani Samiti out of which 14% of the VWSC/Pani Samitis reported to have more than 50% female members. In the state, 7% of villages reported that VWSC/ Pani Samiti is responsible for the operation and maintenance of pipe water supply.

31% of villages reported having identified skilled manpower for O&M of PWS schemes. 20% of villages in the state reported having faced challenges with respect to O&M of PWS schemes.

65% of HHs reported that they are aware of any grievance redressal mechanism w.r.t. HH tap water through PWS, but only 7% HHs have reported a complaint in the last year and only 5% of complaints have been resolved. Among those who reported complaints (i.e., 7% HHs, 1110 village), 73% of the HHs reported their complaints to the pump operators besides other reporting channels.

Overall, 5% of villages in the state levy charge for water service delivery to households whereas 6% HHs reported paying water service delivery charges at the households.

73% of HHs reported that their daily requirement of water was being met by HH tap connections.

Overall, 100% 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, 3% HHs reported using booster pumps to maximize the water flow through their piped water connections.

It was found that 21% of the villages have schemes that are based on groundwater sources, while 2% on surface water sources.

Age-wise functionality of the schemes indicates improvement in 'always functional' schemes and a decrease in the 'non-functional scheme' in the state since 2012. 10-% point

improvement in a fully functional scheme was recorded from 2012 to 2013-18. In 2019 and later the same trend has maintained, however, 77% of schemes have been reported to be always functional and 6% as partially functional (i.e., a total of 83% of schemes).

Impact of JJM

Across the state, none of the HHs reported having an incidence(s) of water-borne diseases in the last year.

Since having a functional HH tap connection, 23% HHs across the state have reported that there has been a change in the no. of employment days of the adult HH members while 63% HHs reported no change.

Out of the HHs reported (i.e., 3845) that female members used to fetch water before HH tap connection, 86% reported that post-installation of HH tap connection helped reduce of time and effort in collection of water.

Across the state, 58% HHs reported that since having a functional HH tap connection the attendance of the girls going to schools has increased, while 15% 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 villages, 88% of households received water on the day of the survey. While 77% of the households were found to have fully functional tap connections. Out of which 97% received an adequate quantity of water, more than four-fifths reported receiving a fully regular supply of water and 93% received potable water.

Since having a functional HH tap connection, 23% reported that there has been a change in no. of employment days. Out of the HHs in which female members used to fetch water before HH tap connection, 85% reported that post-installation of HH tap connection helped reduce time and effort in collecting water. Across the HGJ district, 22% 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, 93% of households received water on the day of the survey. While 80% of the households were found to have fully functional tap connections. Out of which 97% received an adequate quantity of water, more than four-fifths reported receiving a fully regular supply of water and 97% received potable water.

Since having a functional HH tap connection, 28% 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, 88% reported that post-installation of HH tap connection helped reduce time and effort in collecting water. Across the aspirational district, 24% HHs reported that since having a functional HH tap connection their income has directly benefitted.

Functionality Status of JE_AES affected Districts

At the state level for JE-AES districts, 90% of households received water on the day of the survey. While 75% of the households were found to have fully functional tap connections. Out of which 98% received an adequate quantity of water, more than four-fifths reported receiving a fully regular supply of water and 91% received potable water.

Since having a functional HH tap connection, 19% reported that there has been a change in no. of employment days. Out of the HHs in which female members used to fetch water before HH tap connection, 90% reported that post-installation of HH tap connection helped reduce

time and effort in collecting water. Across the JE-AES district, 19% 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	Bihar
Working tap connections- HHs which received water through tap connection at least once in last 7 days (%)	86	89
Quantity ¹ of water received by households		
Adequate quantity (>55 LPCD) (%)	85	97
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	5	1
Inadequate quantity (<40 LPCD) (%)	10	2
Regularity ² of water received by households		
Fully Regular Supply (as per schedule) (%)	80	84
Partially Regular Supply (not as per schedule) (%)	14	9
Irregular Supply (less than 9 months' supply) (%)	6	7
Potable ³ (Quality) water received by households (%)	87	94
Overall functionality ⁴ (%)	62	78

Service delivery parameters	India	Bihar
Overall user satisfaction on regularity at the household level (%)	83	89
Overall user satisfaction on quality at the household level (%)	82	88
Households receiving water supply daily-7 days a week (%)	74	97
Daily HH requirement of water being met by FHTC (%)	80	73
Households paying water service delivery charges (%)	35	6
Households aware of grievance redressal mechanism (%)	71	75
Households reported a reduction in time and effort in collecting water (%)	79	86
Average no. of times water is supplied in a day	1	2
Households reported incidence of water-borne diseases in the last year (%)	2	0.4
Households purifying water before drinking (%)	57	11
Residual Chlorine (RCL) detected within permissible limits (%)	24	5
Villages with Field Test Kits (%)	30	13
Villages in which bacteriological test was done in last 1 year by VWSC/ Pani Samiti (%)	29	21
Villages reported to have a mechanism for chlorination (%)	21	26

Institutional arrangement	India	Bihar
Village reported having presence of VWSC/ Pani Samiti (%)	38	23
Villages in which VWSC/ Pani Samiti is responsible for Operation & Maintenance of PWS schemes (%)	14	7
Villages in which persons are trained to use Field Test Kits (%)	31	14
Villages levying water service delivery to households (%)	34	5
Villages having skilled manpower for Operation & Maintenance of PWS schemes (%)	31	31
Community monitoring of water wastage in villages (%)	19	11
Villages in which signages about JJM were observed (%)	15	30

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

² Regularity is receiving water for 12 months or daily basis as per schedule

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

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

Functionality status of tap connection at households in Har Ghar Jal Districts	India	Bihar
Working tap connections- HHs which received water through tap connection at least once in last 7 days (%)	91	88
Quantity of water received by households		
Adequate quantity (>55 LPCD) (%)	88	97
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	4	1
Inadequate quantity (<40 LPCD) (%)	8	2
Regularity of water received by households		
Fully Regular Supply (as per schedule) (%)	84	84
Partially Regular Supply (not as per schedule) (%)	11	8
Irregular Supply (less than 9 months' supply) (%)	5	8
Potable (Quality) water received by households (%)	90	93
Overall functionality (%)	69	77

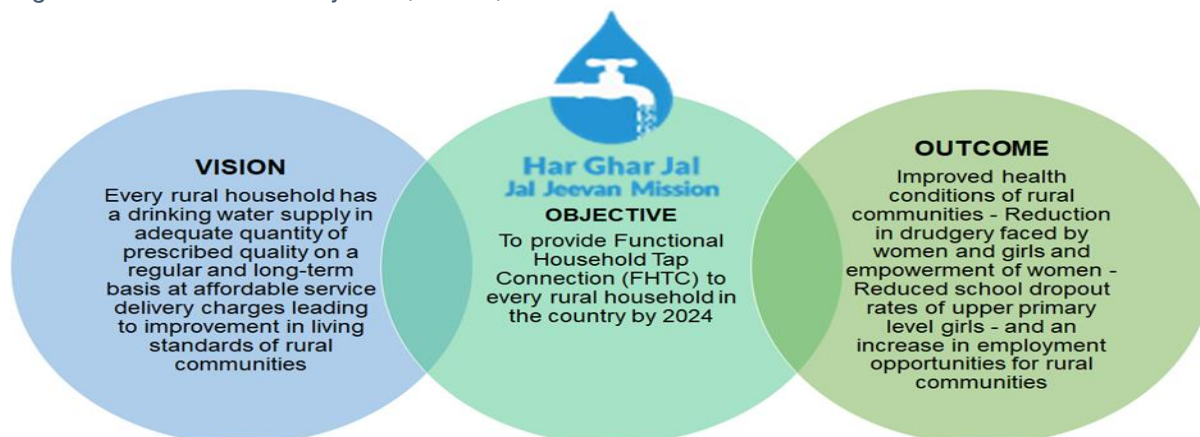
Functionality status of tap connection at households in Aspirational Districts	India	Bihar
Working tap connections- HHs which received water through tap connection at least once in last 7 days (%)	78	93
Quantity of water received by households		
Adequate quantity (>55 LPCD) (%)	85	97
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	5	1
Inadequate quantity (<40 LPCD) (%)	10	2
Regularity of water received by households		
Fully Regular Supply (as per schedule) (%)	77	84
Partially Regular Supply (not as per schedule) (%)	14	8
Irregular Supply (less than 9 months' supply) (%)	9	8
Potable (Quality) water received by households (%)	88	97
Overall functionality (%)	62	80

Functionality status of tap connection at households in JE-AES Districts	India	Bihar
Working tap connections- HHs which received water through tap connection at least once in last 7 days (%)	79	90
Quantity of water received by households		
Adequate quantity (>55 LPCD) (%)	95	98
Partially adequate quantity (> 40 LPCD - < 55 LPCD) (%)	2	1
Inadequate quantity (<40 LPCD) (%)	3	1
Regularity of water received by households		
Fully Regular Supply (as per schedule) (%)	80	82
Partially Regular Supply (not as per schedule) (%)	13	11
Irregular Supply (less than 9 months' supply) (%)	7	7
Potable (Quality) water received by households (%)	89	91
Overall functionality (%)	69	75

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: Bihar

The state of Bihar lies on the eastern part of India and has a population of 10,40,99,452 people. It has 38 districts and 39456 villages where 37977 villages have PWS schemes. The state lies on the Lower Gangetic Plains region and receives an average annual rainfall of about 1098.9mm. Among the villages with PWS schemes, 36508 villages (92.53%) 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:

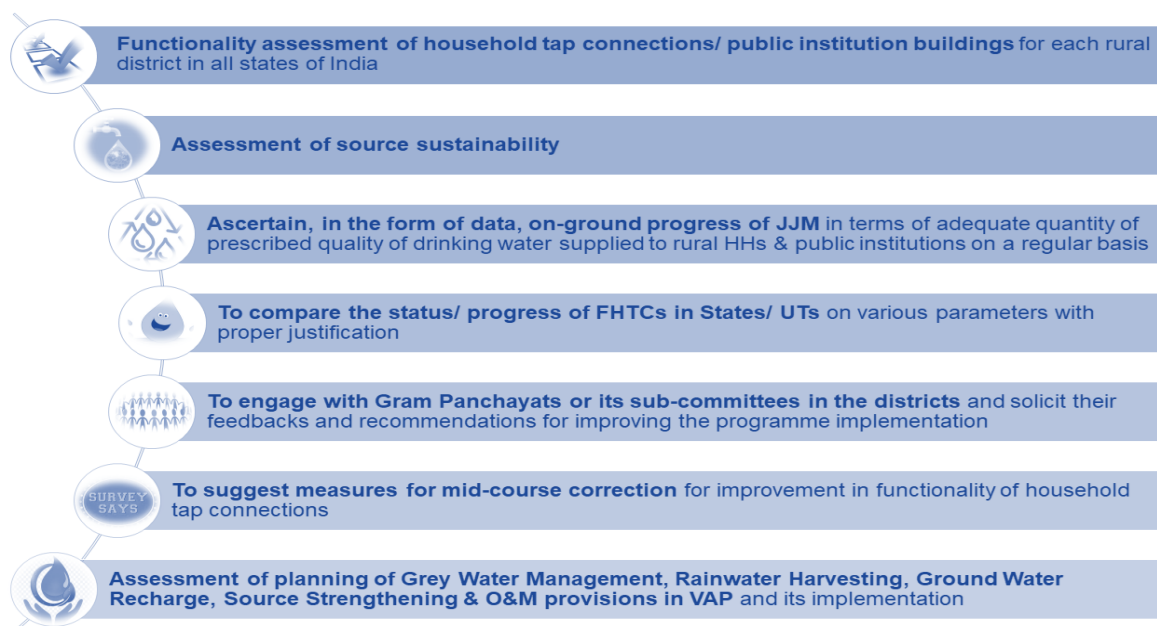
- Not a Har Ghar Jal state.
- 26 districts are Iron & 10 districts are Fluoride affected
- 36508 (92.53% of all) villages with PWS more than 20 FHTC
- 73.03% villages covered under HH tap connections under HGJ



2.2. FHTC Assessment Objectives

The overall objectives of the FHTC assessment are as presented:

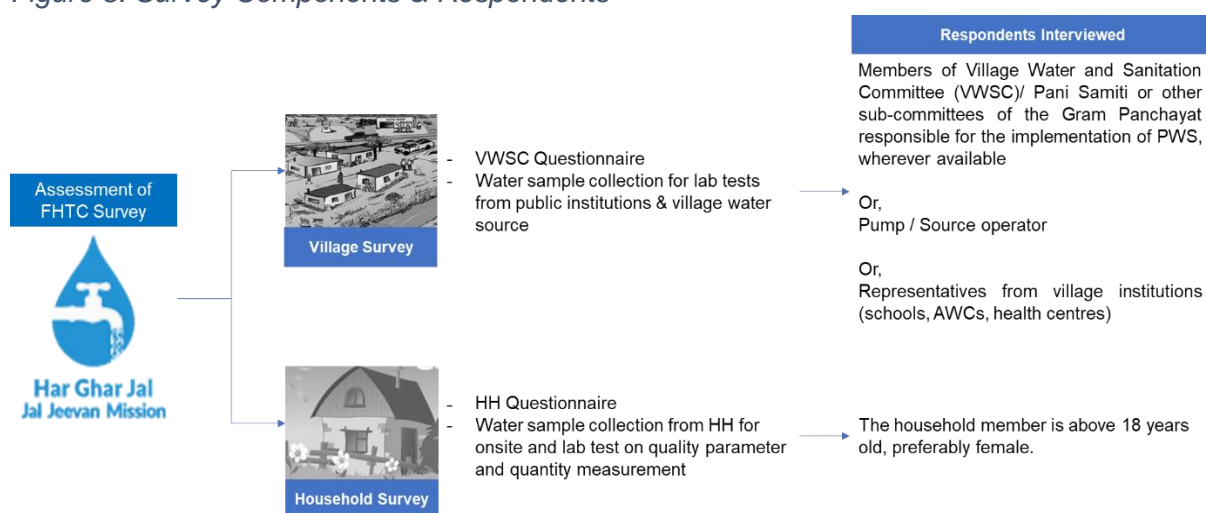
Figure 4: FHTC Assessment Objectives



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

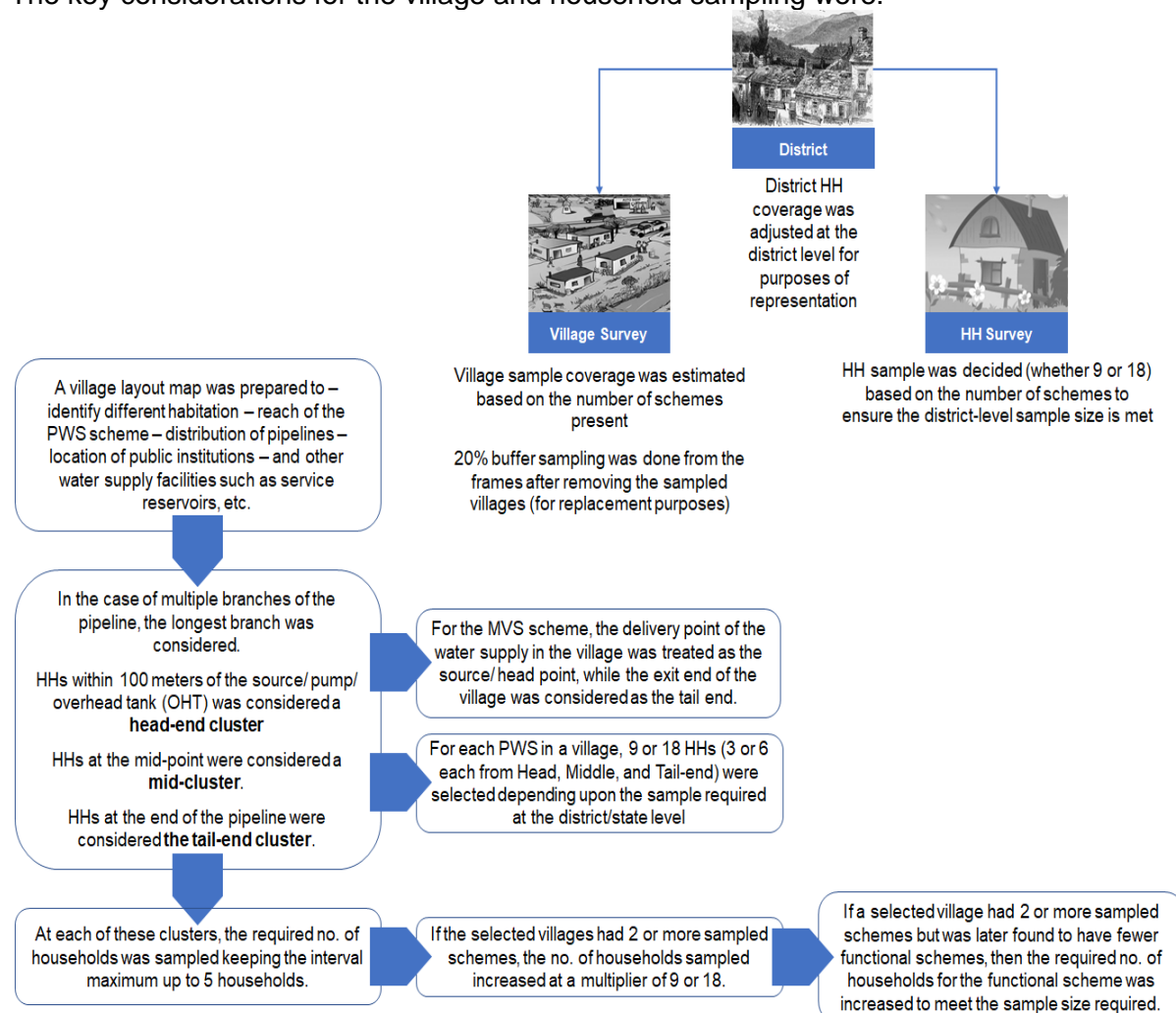
As per the design, all villages having a PWS scheme with 20 or more functional household tap connections were included in the sample frame. The probability proportionate to size (PPS) method was used for village selection in each district. The steps for random selection of villages using PPS are presented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

Figure 6: Steps for Random Sampling of Villages



Figure 7: Household Selection

The key considerations for the village and household sampling were:

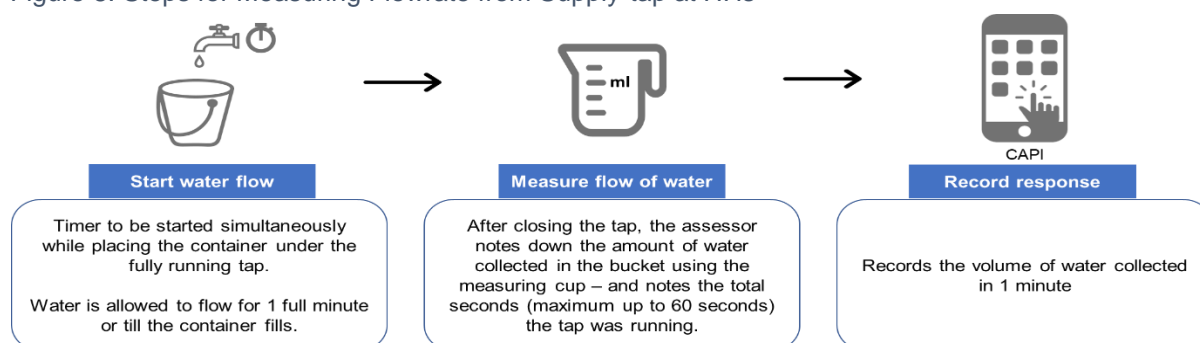


The record of all district-wise village replacements is maintained and reported as part of the annexure.

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:

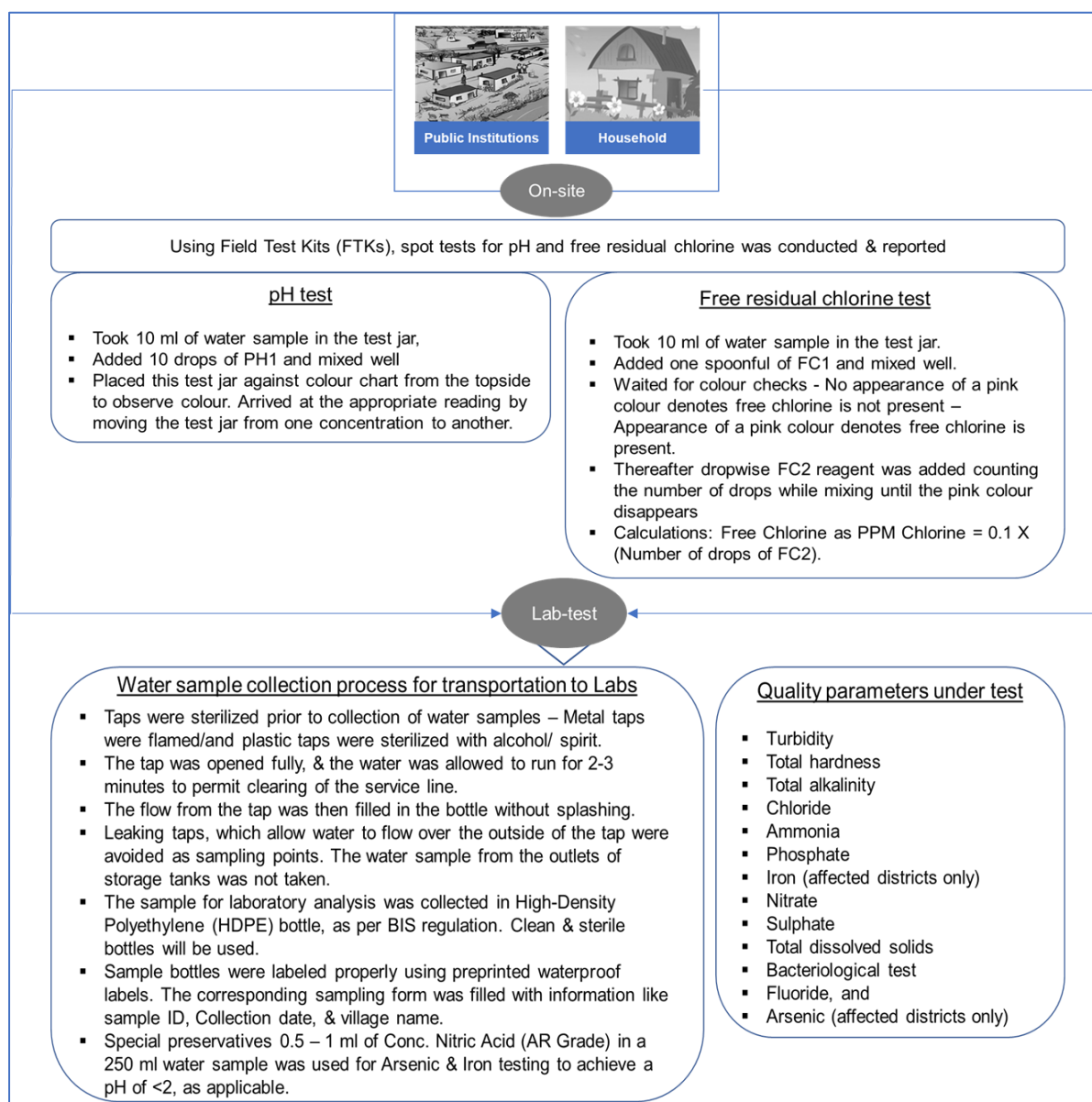
- Assessor first asked and recorded length, breadth, and height.
- Assessor dipped a 5 feet long rod, marked the level of the water table, and calculated the volume – length x breadth x-height of water.
- Next the assessor opened the valve of the connection and allowed the water to flow inside the storage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

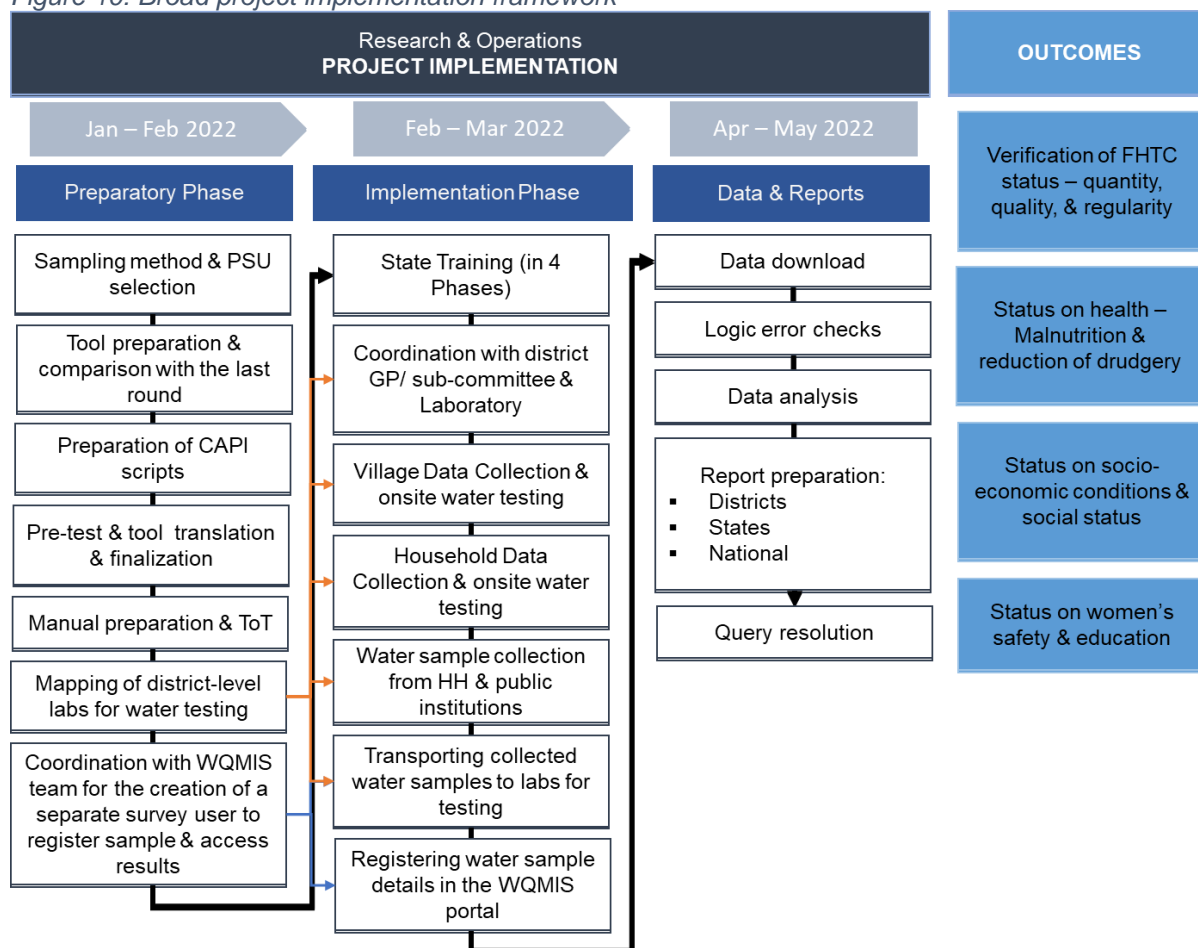


JJM, with the support of the BMI Division of ICMR, enabled a new interface on the WQMIS portal for “Functionality Assessment (FA) User” to enable seamless harmonization of water sample registration, and sample submission for testing, and sharing of results as per the applicable quality parameters.

2.8. Project Implementation

An overview of the project implementation is as presented:

Figure 10: Broad project implementation framework



A total of 15 teams (comprising 15 supervisors, 90 assessors, and 15 water collection assistants) were recruited, trained, and deployed to complete the survey across the states of Bihar. 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
Bihar	15 Teams	18 th February	2 nd April	42 Days

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

2.9. Sample coverage

Table No. 2: Sample covered							
State	Targeted sample			Achieved sample			
	District	Village	HH	District	Village	HHs	PIs
India	712	13,300	3,00,000	712	13,299	3,01,389	16,148
Bihar	38	812	16,308	38	812	16,404	318

2.10. Sampled village and household profile

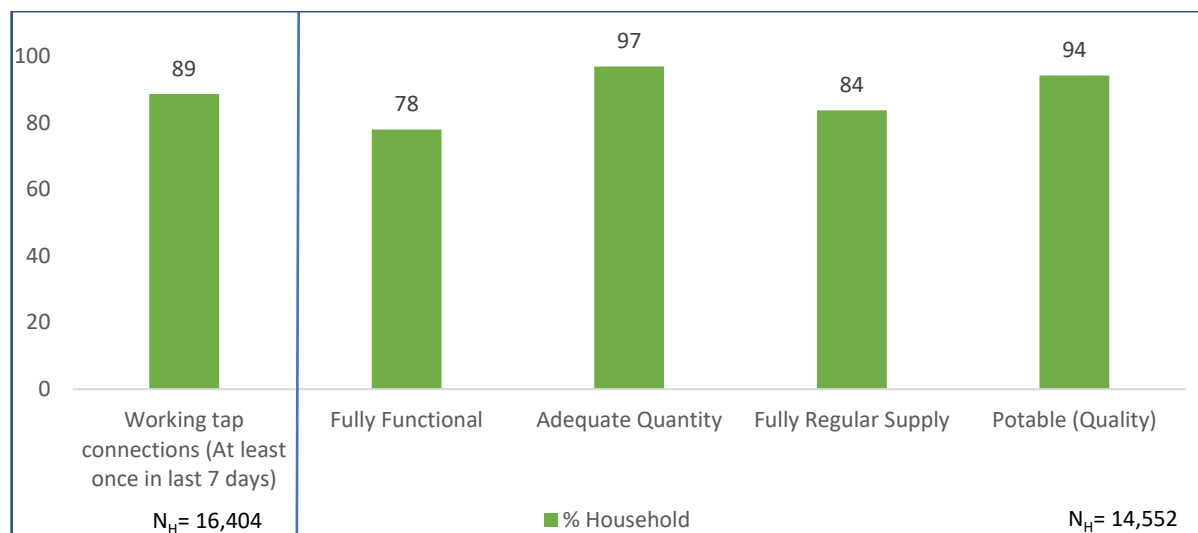
SAMPLED VILLAGES	SAMPLED HOUSEHOLDS
<ul style="list-style-type: none"> Total no. of villages covered in the state – 812 Percentage of SC dominated villages covered in the state is 8.4% (while at national level the average is 12.6%) Percentage of ST dominated villages covered in the state is 1.2% (while at national level the average is 20.2%) Higher proportion of pump operator interviewed at the village level 1.7% of the villages reported to have any historical incidence of water contamination 	<ul style="list-style-type: none"> Total no. of households covered in the state – 16404 (Respondents: Male 5763, Female 10641) Proportion of General – 19.0%, SC 20.8%, ST 4.9%, OBC 54.3% households 64.9% of the FHTC connections are under the name of a female member Average household size – 6.7 100% positive user experience in 5/5 measures

3. Findings

3.1. Functionality status of FHTC at household level

A. Overall Functionality* (in %)

Figure 11: Functionality of HH tap connection



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

Please note: Henceforth, N_H=14552 implies all HHs where water was found on the day of the survey.

It has been found that 89 percent of the sampled HHs (N=14552) had working tap connections. Moreover, almost all the households (97 percent) received adequate (≥ 55 LPCD) water supply and more than 4 out of 5 received regular supply (84 percent) of water. The on-site testing and lab test results of the water indicates that more than 9 out of 10 (94%) of the sampled households in the state receive potable water.

Out of the 16404 HHs sampled for the FHTC assessment, water quantity and quality test was carried out in 14552 due to non-availability of water in 12 percent HHs on the day of survey.

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

Table No. 3: Quantity, Regularity, and Quality of FHTC at the district level (%HH)					
S. No.	District	Working tap connections (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.	Muzaffarpur	100	97	84	97
2.	Samastipur	100	98	89	100
3.	Lakhisarai	100	98	84	95
4.	Jamui	100	93	95	94
5.	Nalanda	99	100	89	94
6.	Begusarai	99	100	86	99
7.	Saharsa	98	98	96	93
8.	Madhepura	98	96	97	100
9.	Supaul	98	100	95	99
10.	Sheikhpura	98	99	81	98
11.	Katihar	97	98	81	100
12.	Khagaria	97	99	88	100

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)
13.	Bhagalpur	97	99	93	98
14.	Nawada	96	99	85	91
15.	Gopalganj	96	98	86	99
16.	Madhubani	96	98	74	94
17.	Munger	96	98	92	98
18.	Kishanganj	96	100	84	90
19.	Gaya	95	98	63	98
20.	Jehanabad	94	98	65	9
21.	Siwan	94	95	82	95
22.	Sheohar	94	99	76	99
23.	Darbhanga	93	97	78	100
24.	Saran	92	97	84	100
25.	Purnia	92	100	82	99
26.	Bhojpur	91	96	70	95
27.	Patna	90	99	83	97
28.	Vaishali	89	100	83	99
29.	Banka	89	100	98	97
30.	BIHAR	89	97	84	94
31.	Sitamarhi	87	84	70	99
32.	Buxar	84	100	74	97
33.	Araria	83	100	98	99
34.	Aurangabad-Bh	79	95	82	92
35.	Pashchim Champaran	74	93	81	95
36.	Rohtas	57	98	80	81
37.	Arwal	55	93	77	99
38.	Purba Champaran	53	97	88	95
39.	Kaimur (Bhabua)	41	88	62	98
# 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		

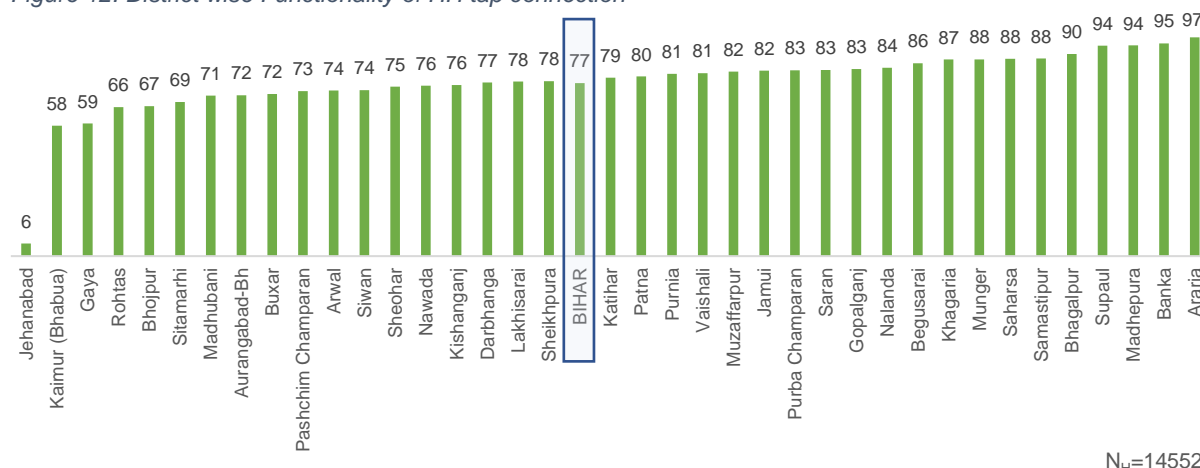
District level comparison across the districts indicate that Sitamarhi, Buxar, Araria, Aurangabad, Pashchim Champaran, Rohtas, Arwal, Purba Champaran, and Kaimur (Bhabua) reported functionality less than the state average. All the districts except Jamui, Pashchim Champaran, Arwal, Kaimur (Bhabua), and Sitamarhi FHTC provide more than 55 LPCD of water in more than 95 percent HHs.

More than 95 percent HHs in the districts of Banka, Araria, Madhepura, Saharsa, Jamui, and Supaul reported to regularly receive water through FHTC. Regular supply of water is less than 70 percent in the districts of Kaimur (Bhabua), Jehanabad and Gaya.

Potability of water was found to be more than 40 percent in the districts of Samastipur. Whereas in all other districts except Muzaffarpur, Sheohar, Gopalganj, and Katihar, the potability of water was found less than 10 percent.

B. District wise functionality status

Figure 12: District wise Functionality of HH tap connection

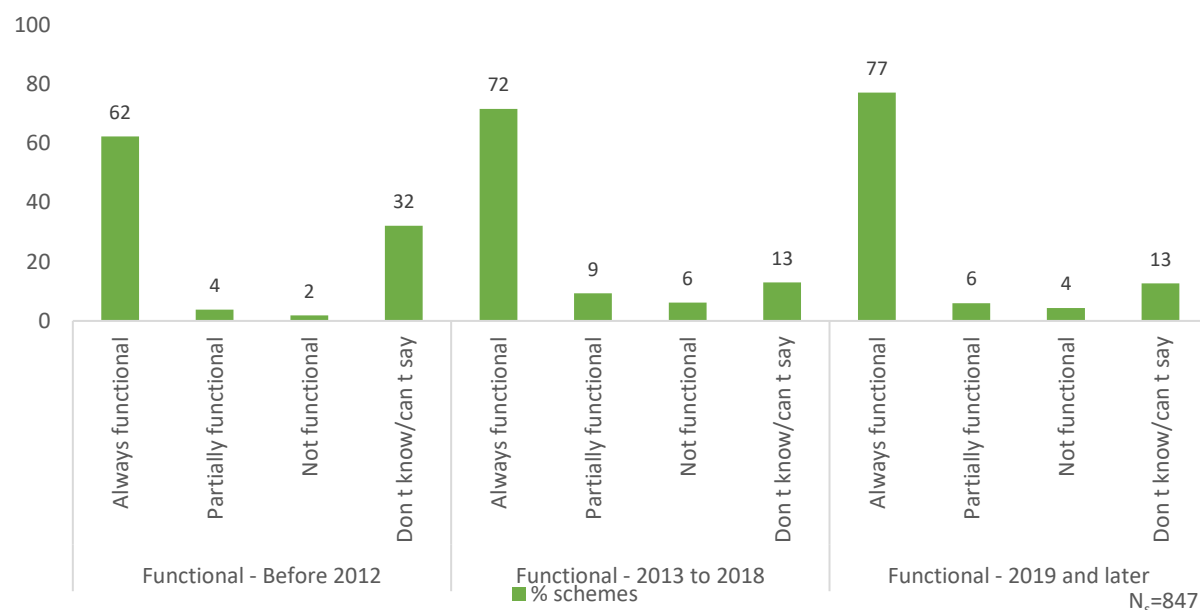


* 'Functionality' has been computed as the intersection of Adequate Quantity, Fully Regular Supply and Potable (Quality) for households wherein water supply was available at the time of survey, i.e., 14,552 HHs.

78 percent HHs in the state were found to have functional HH tap water connection. Araria and Banka district reported 98 percent functional households in the state, followed by Supaul with about 95 percent functionality. In the districts of Gaya, Kaimur (Bhabua), and Jehanabad, less than two-third of the households have functional HH tap water connection highlighting scope for improved service delivery.

C. Age vs functionality of schemes in the villages

Figure 13: Age vs functionality of schemes in the villages



More than 6 out of 10 schemes are functional since 2012 which reflects a 10-point increase in till 2018 and 5-point increase in 2019 and later.

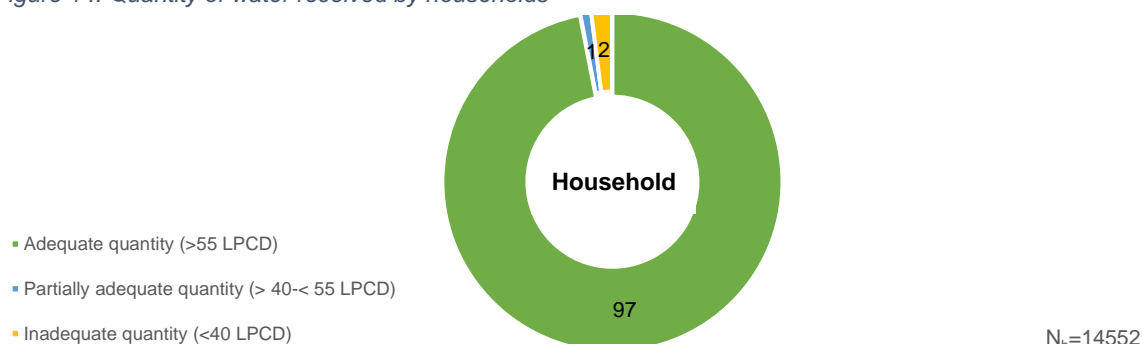
3.2. Quantity, Regularity, and Quality of Water

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

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

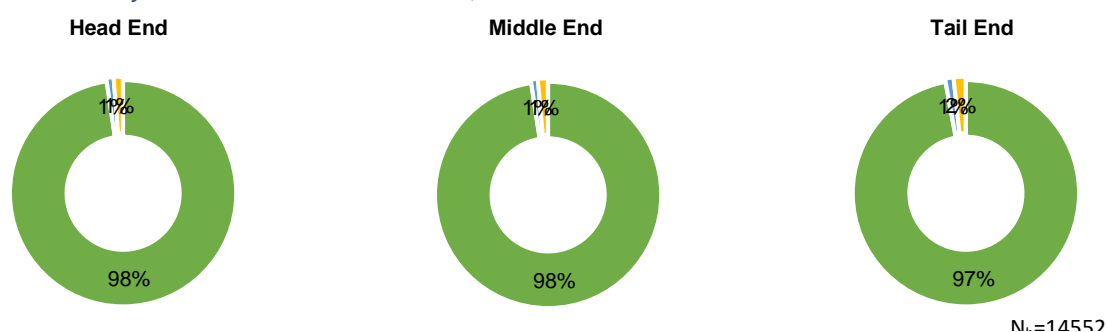
98% HHs reported receiving adequate quantity of water (more than 55 LPCD of water)

Figure 14: Quantity of water received by households



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

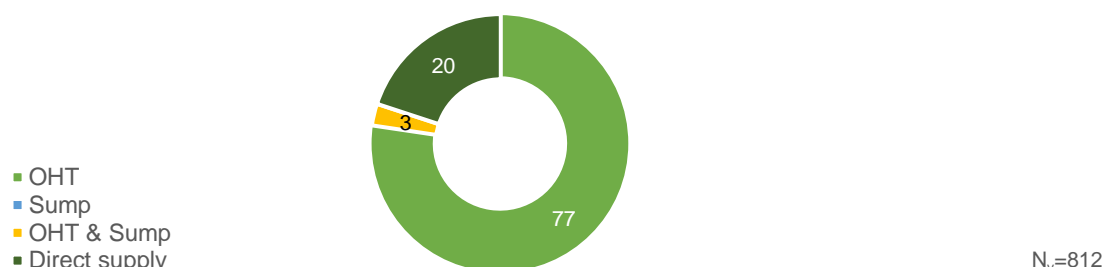
Figure 15: Quantity of water received across head, middle and tail end households



The quantity of water received across the head, middle, and the tail end was observed to have declined, and more than ninety percent (98 percent) 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 %)

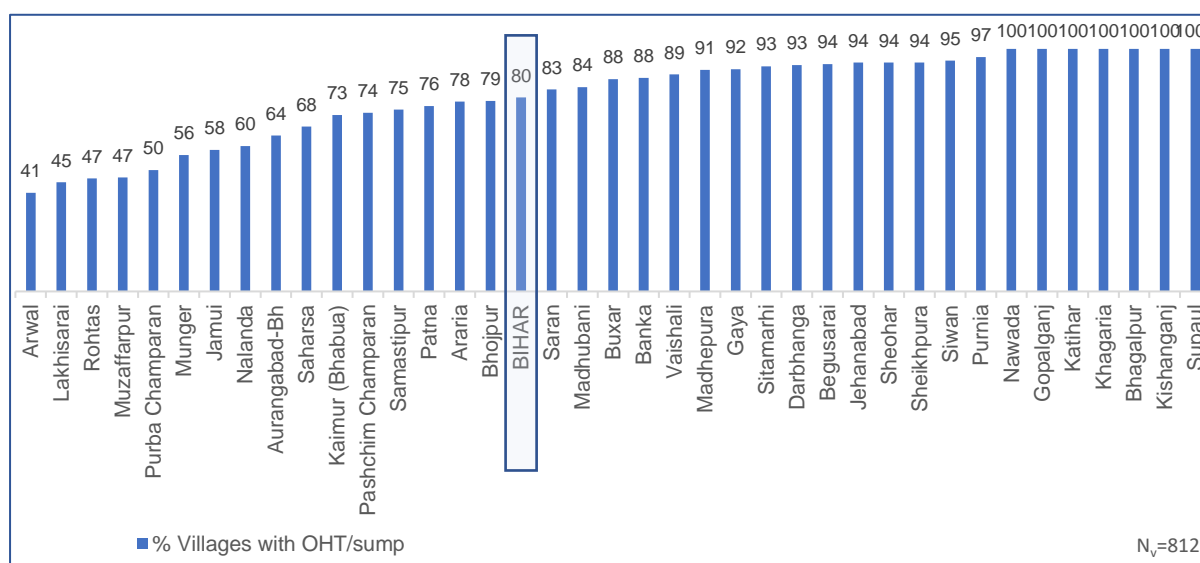
Figure 16: Pipe water supply storage available in village



About one out of five (20%) respondents in the state reported water being directly supplied. And in 80 percent reported water being stored in sump and overhead tanks.

80 percent villages in the state have either an OHT or a sump for storing water for supplying to the households. Nawada, Gopalganj, Katihar, Khagaria, Bhagalpur, Kishanganj, and Supaul are the districts where all the villages have either an OHT or a sump, followed Siwan, and Purnia where more than 95 percent of the villages have facilities to store water for supplying to the households.

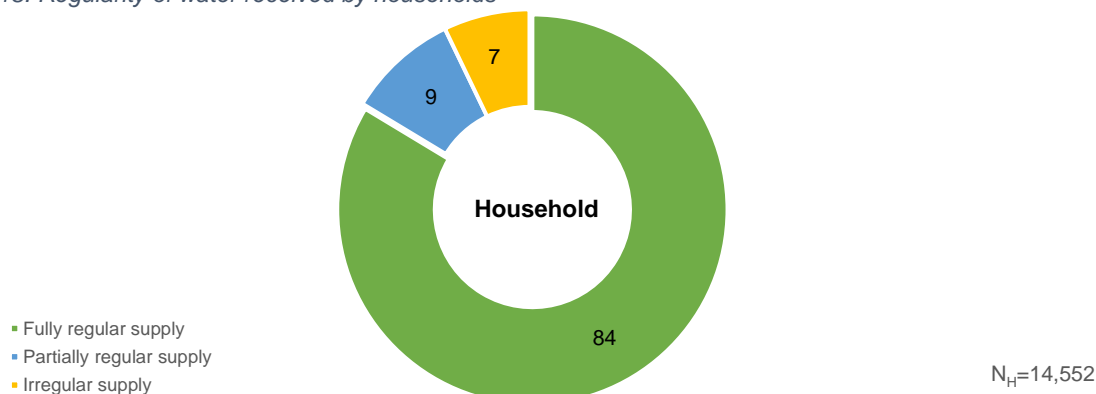
Figure 17: District wise water storage arrangements at village level (% villages with OHT/ Sump)



B. Regularity of water supply to villages and households

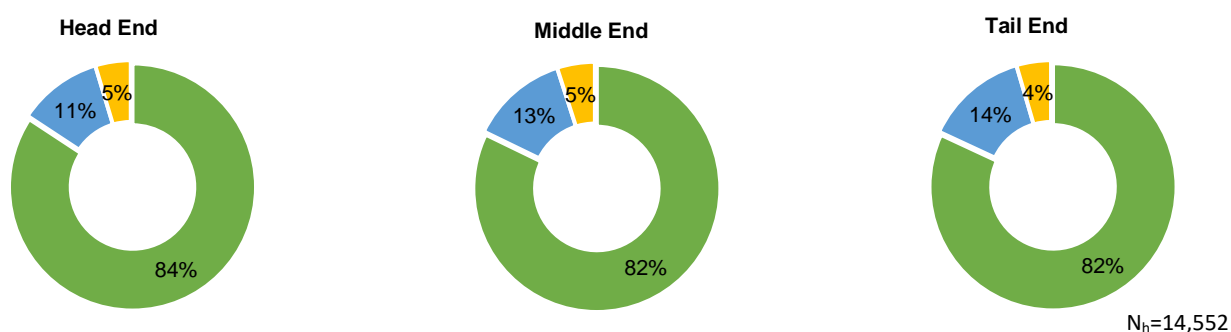
84% HHs receive a regular supply of water (as per agreed schedule)

Figure 18: Regularity of water received by households



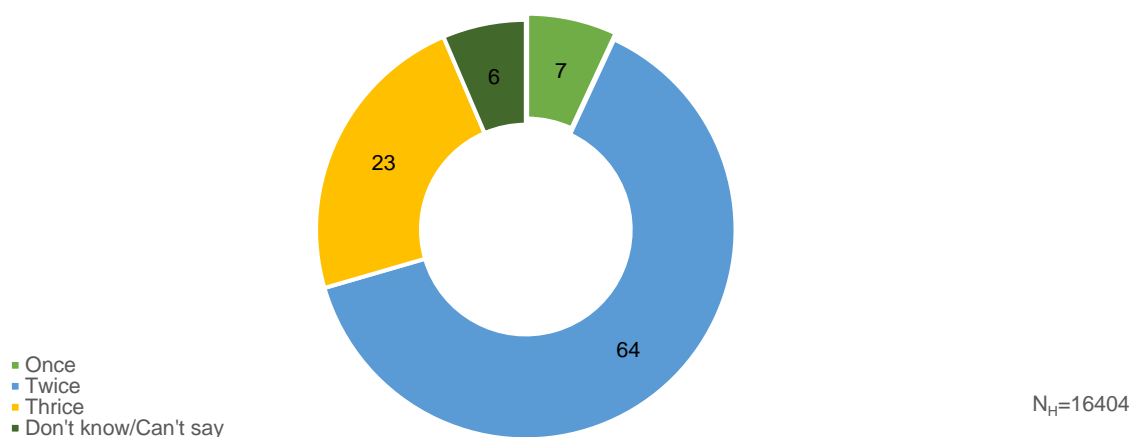
Regularity of water received across head, mid, and tail end

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 tail end and head end.

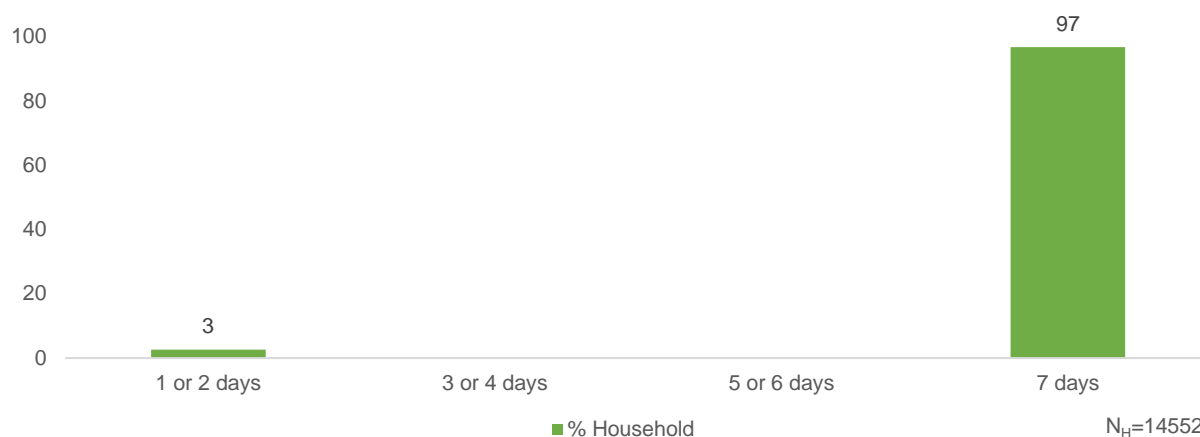
Figure 20: Average no. of times water is supplied in a day



HHs in **23 percent of districts** receive water 3 times a day. The average duration of water supply across the state was reported to be **4 hours per day**.

Average water supply days in a week to households

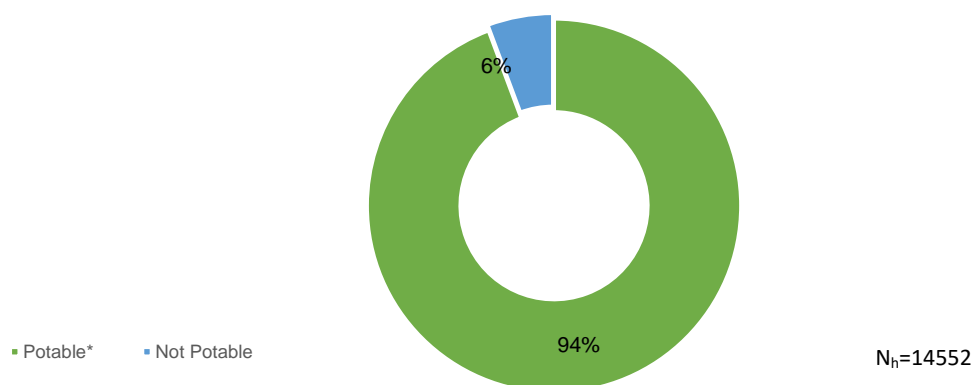
Figure 21: Average number of days households receive water supply in a week (in %)



97 percent of households in the state receive water all the seven days in a week.

C. Potability Water – Quality

Figure 22: Potable water received by households



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

Among the sampled households in Bihar where water was found on the day of the survey, the potability of water was found to be 94%.

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

Quality Parameters (N _v =812)	Water Samples Tested from Public Institutes			
	Anganwadi Centre	Health Facility	Schools	Others
pH (on-site)	96	95	97	92
Turbidity	100		100	100
Total Hardness	100	100	100	100
Total Alkalinity	100	100	100	100
Chloride	100		100	100
Ammonia	Not Tested			
Iron	99	100	100	97
Nitrate	100	100	100	100
Sulphate	100	100	100	100
Total Dissolved Solids	100	100	100	100
Bacteriological Test (Absence)	85	100	87	94
Fluoride	100		100	100
Arsenic	100		100	99

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=16404). 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)	16404	87
Turbidity	7861	99
Total Hardness	8733	100
Total Alkalinity	8951	100
Chloride	1922	100
Ammonia	Not Tested	
Iron	10106	100
Nitrate	5327	100
Sulphate	5025	100
Total Dissolved Solids	8120	100
Bacteriological Test (Absence)	2925	87
Fluoride	7772	99
Arsenic	6130	100

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

The Residual Chlorine (RC) in the state of Bihar was found in 5% samples. And no samples were having RC outside range while 95% samples, had no RC. 87% of water samples passed the bacteriological contamination test. While in 13% samples bacteriological contamination is found, out of which in 13% samples there was no chlorination.

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

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

Comment on functioning of District Lab:

The district lab tested water samples for 11 water quality parameters. 14,870 water samples were submitted, and 14,137 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.

Sl. No	District	Lab available	HH surveyed	Samples submitted	Report received	Overall lab experience
1	Patna	Yes	399	372	363	The labs did not have capacity to test more than 40 number of samples and had issues of human resource, reagents etc
2	Nalanda	Yes	487	494	486	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
3	Bhojpur	Yes	397	361	348	Laboratory had denied receiving the sample on weekends initially, however the issue was resolved later with the help of PHED and chief chemist of the state
4	Rohtas	Yes	498	286	253	The labs did not have capacity to test more than 40 number of samples and had issues of human resource, reagents etc
5	Aurangabad-Bh	Yes	441	350	331	Laboratory had denied receiving the sample on weekends initially, however the issue was resolved later with the help of PHED and chief chemist of the state
6	Jehanabad	Yes	396	379	375	The labs did not have any issue with testing the number of water samples submitted nor had any issues with

Table No. 6: Performance of Labs						
Sl. No	District	Lab available	HH surveyed	Samples submitted	Report received	Overall lab experience
						human resource, reagents etc
7	Arwal	Yes	497	285	275	The labs did not have capacity to test more than 40 number of samples and had issues of human resource, reagents etc
8	Gaya	Yes	487	486	460	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	Nawada	Yes	396	387	379	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
10	Saran	Yes	428	401	399	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	Siwan	Yes	387	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
12	Gopalganj	Yes	379	374	373	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	Pashchim Champaran	Yes	435	322	144	The labs did not have capacity to test more than 40 number of samples and had issues of human resource, reagents etc
14	Purba Champaran	Yes	396	215	209	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	Sitamarhi	Yes	382	336	335	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	Muzaffarpur	Yes	406	418	384	Laboratory had denied receiving the sample on weekends initially, however the issue was resolved later with the help of PHED and chief chemist of the state
17	Vaishali	Yes	388	355	344	The labs did not have any issue with testing the number of water samples submitted

Table No. 6: Performance of Labs						
Sl. No	District	Lab available	HH surveyed	Samples submitted	Report received	Overall lab experience
						nor had any issues with human resource, reagents etc
18	Begusarai	Yes	433	434	431	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	Samastipur	Yes	379	383	371	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
20	Darbhanga	Yes	387	365	348	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	Madhubani	Yes	387	379	300	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	Saharsa	Yes	477	478	471	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	Madhepura	Yes	520	525	519	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	Purnia	Yes	477	450	444	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	Katihar	Yes	378	377	375	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	Khagaria	Yes	396	385	382	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	Munger	Yes	391	385	373	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc

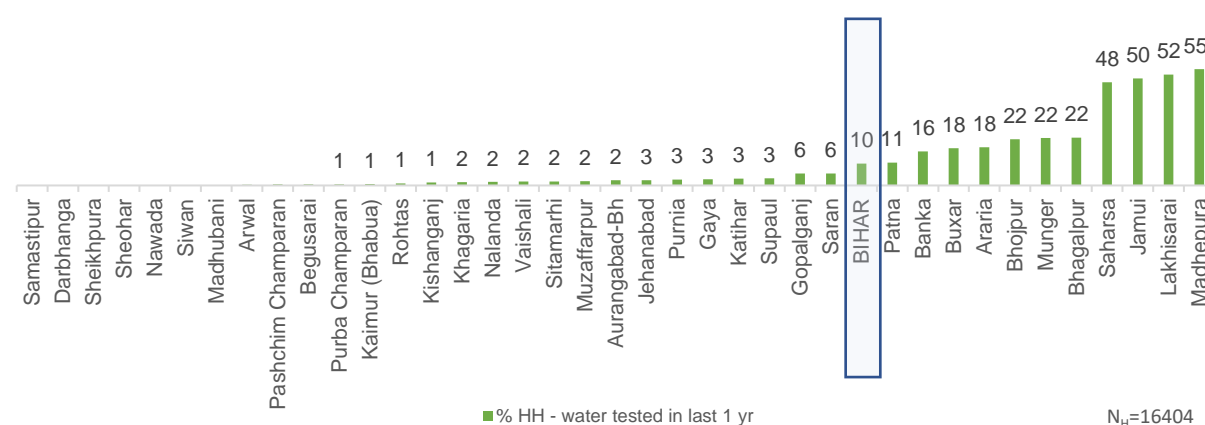
Table No. 6: Performance of Labs						
Sl. No	District	Lab available	HH surveyed	Samples submitted	Report received	Overall lab experience
28	Bhagalpur	Yes	427	423	418	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
29	Araria	Yes	402	338	334	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	Kishanganj	Yes	504	494	479	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
31	Sheohar	Yes	413	393	350	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
32	Supaul	Yes	513	523	522	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
33	Banka	Yes	400	363	329	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
34	Lakhisarai	Yes	398	409	353	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
35	Sheikhpura	Yes	450	451	439	Laboratory had denied receiving the sample on weekends initially, however the issue was resolved later with the help of PHED and chief chemist of the state
36	Buxar	Yes	496	419	401	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
37	Kaimur (Bhabua)	Yes	499	207	199	The labs did not have any issue with testing the number of water samples submitted nor had any issues with human resource, reagents etc
38	Jamui	Yes	478	493	472	The labs did not have any issue with testing the number of water samples submitted

Table No. 6: Performance of Labs						
Sl. No	District	Lab available	HH surveyed	Samples submitted	Report received	Overall lab experience
						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

10% of HHs reported that their HH tap-water was collected and tested in the last one year.

Figure 23: Households where tap water was tested in the last one year

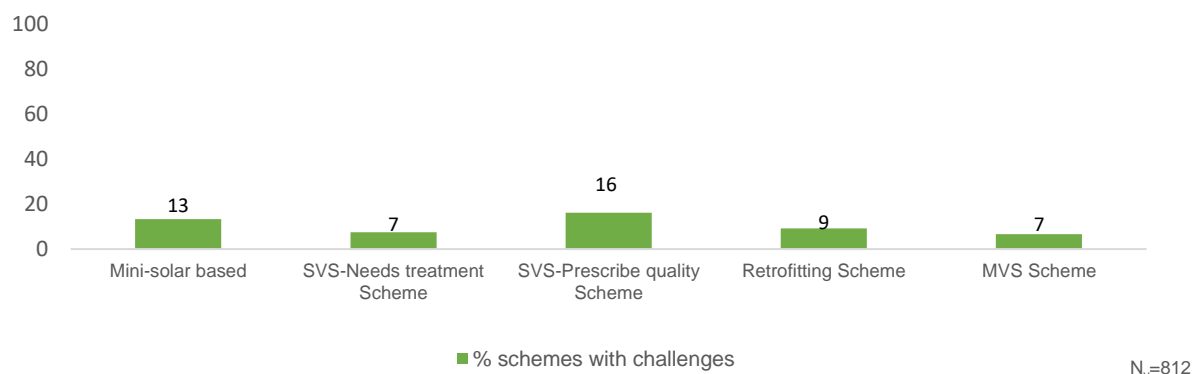


3.3. Operation and Maintenance (O&M) of schemes at village level

Schemes reported to have faced challenge in village

The SVS-Prescribed quality faced the most challenges (16%) in comparison to the other schemes in the state.

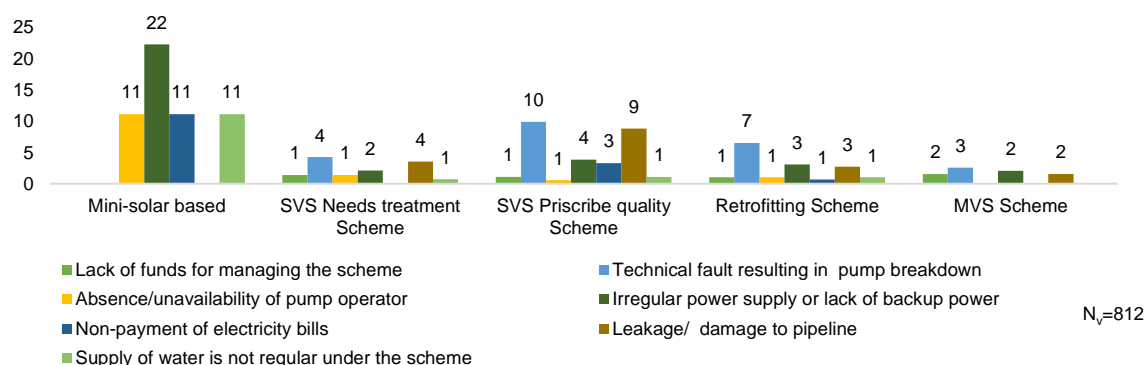
Figure 24: Schemes reported to have faced challenge in village



Type of challenge faced by the schemes

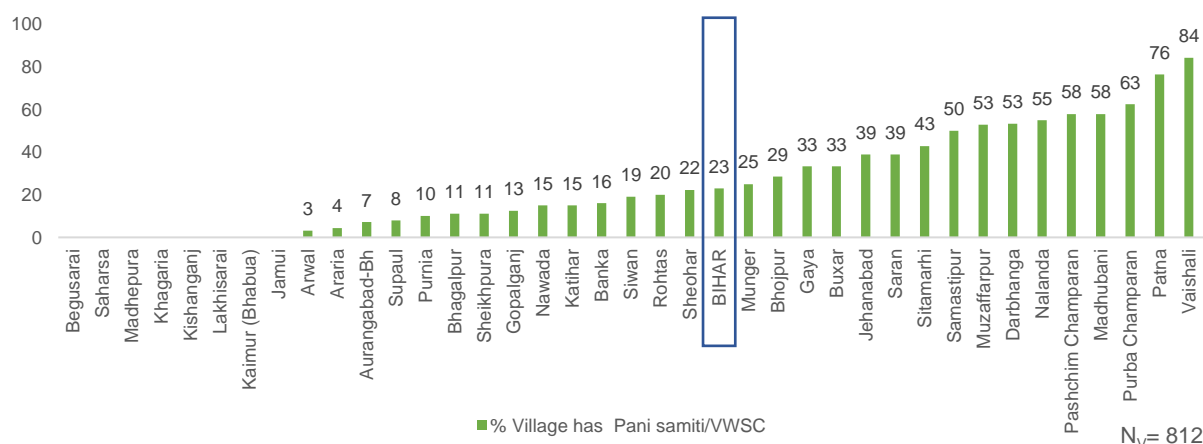
The most faced problem varied from one scheme to another. However, 'Irregular power supply or lack of backup power' is a problem that was found unanimously in all the schemes.

Figure 25: Type of challenge faced by the schemes



A. Presence of VWSC/Pani Samiti

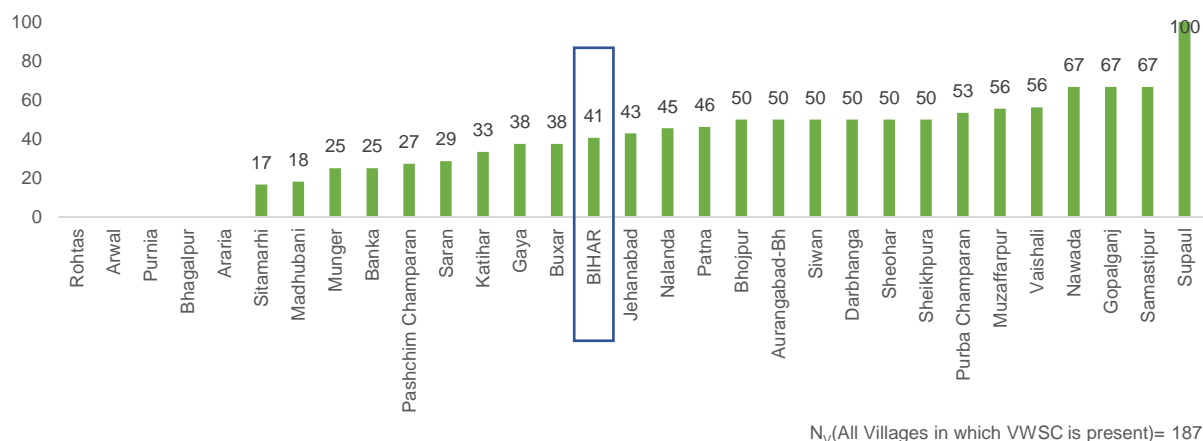
Figure 26: Villages where VWSC/ Pani Samiti is present



23% of villages in the state reported to have a VWSC or a Pani Samiti.

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

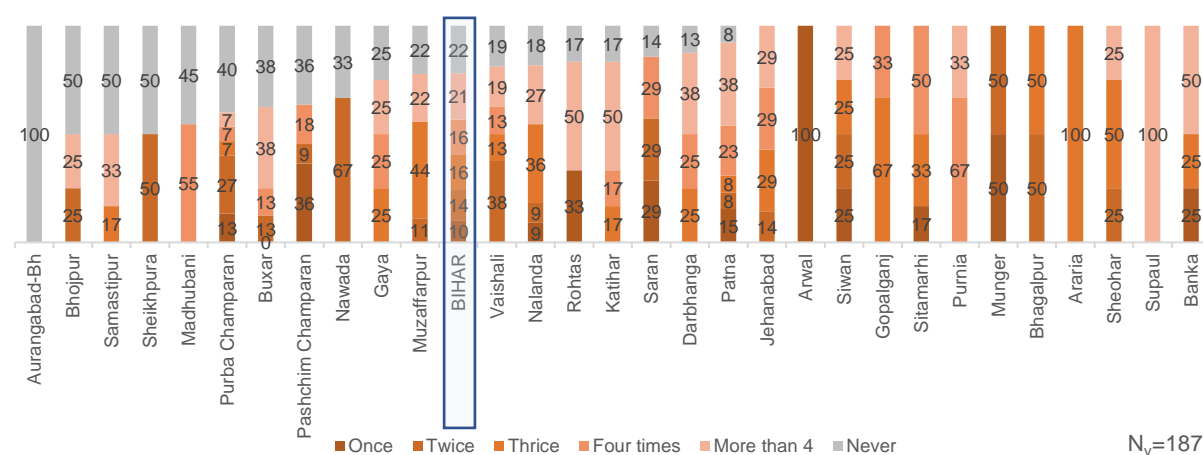
Figure 27: VWSC/ Pani Samiti with more than 50 percent female members



About 41 percent of the VWSC/Pani Samitis in Bihar were having more than 50 percent female members.

C. VWSC Meetings in last one year

Figure 28: VWSC meetings held in last one year

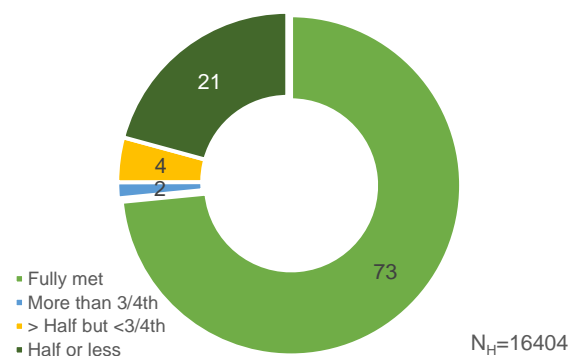


Across the villages in the state, that reported to have VWSC/Pani Samitis (265 villages), no meetings in last one year was reported the most (22%)

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

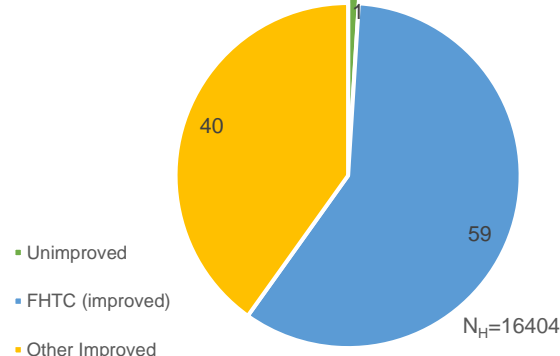
73 percent of HHs reported that their daily requirement of water was being met by HH tap connections

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



59 percent HHs reported HH tap connections as their primary source of drinking water

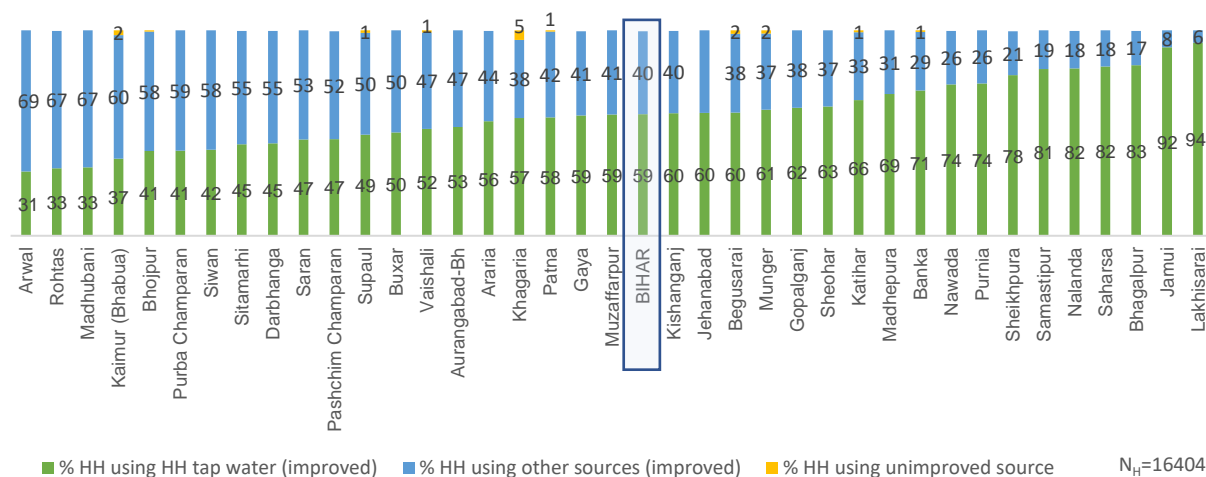
Figure 30: Households reported FHTC as primary source of drinking water



About 3 out of 4 (73%) HHs reported their daily requirement of water being fully met by the HH tap connections. And 59 percent HHs reported used household tap connection for drinking water (primary source). About 40 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.

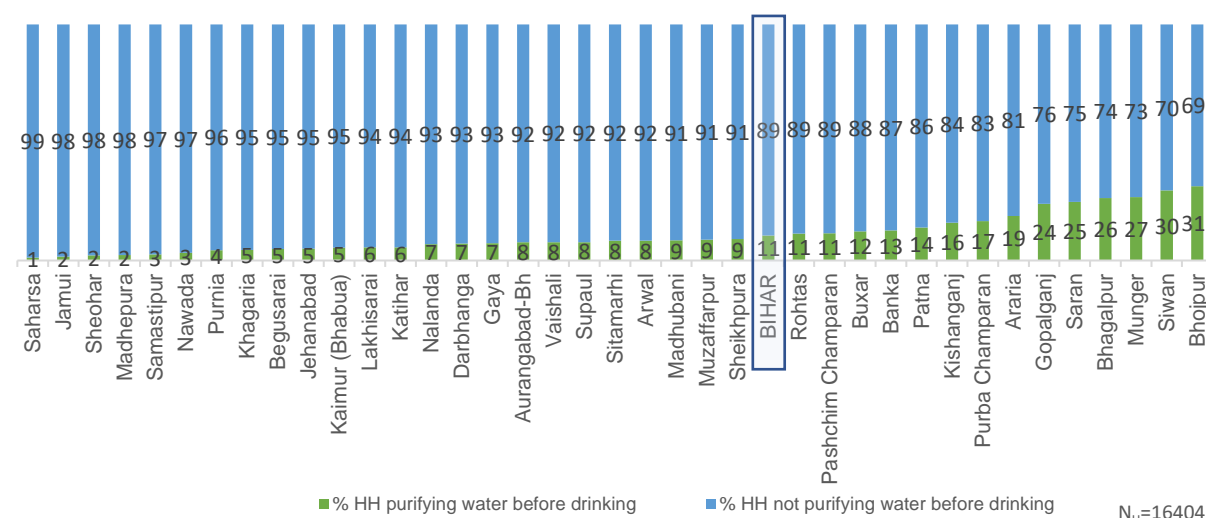
Overall, 100 percent of HHs reported using improved primary source of drinking water, out of which 59 percent of HHs reported HH tap water as their primary source.

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



A. Households who practice of purifying water before drinking

Figure 32: Households who practice of purifying water before drinking

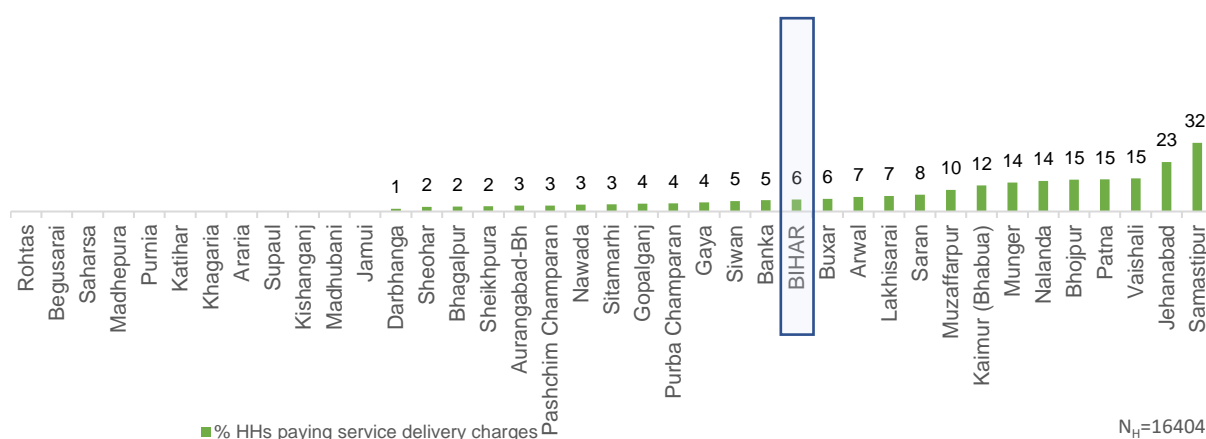


Practice of purifying water before drinking was reported the most in Bhojpur (31%) where 41 percent HHs reported using HH tap water as primary drinking water source, while the least was reported in Saharsa (1%) where 82 percent HHs reported using HH tap water as a primary drinking water source.

B. Households paying water service delivery charges

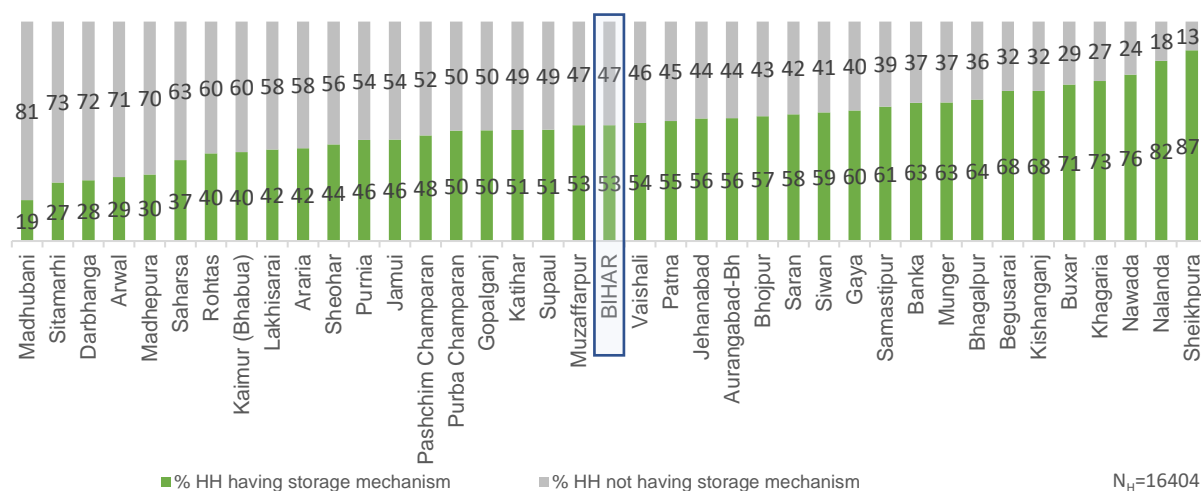
In Bihar, around 6% of the sampled households were found to be paying service delivery charges, Samastipur being the district with the highest percentage of such households (32%).

Figure 33: Households paying water service delivery charges



C. Storage mechanism used by households

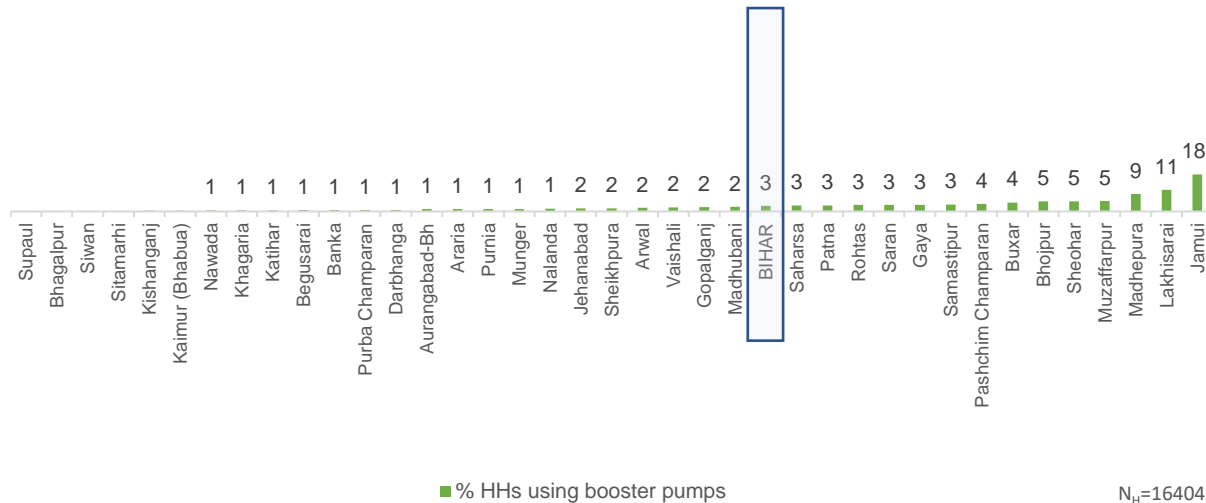
Figure 34: Households having storage mechanisms



D. Households using booster pumps

Overall, **3% HHs** reported using booster pumps to maximize the water flow through their piped water connections. Jamui and Lakhisarai reported 18% and 11% of HHs using booster pump in the state respectively while Supaul, Bhagalpur, Siwan, Sitamarhi, Kishanganj, and Kaimur reported none.

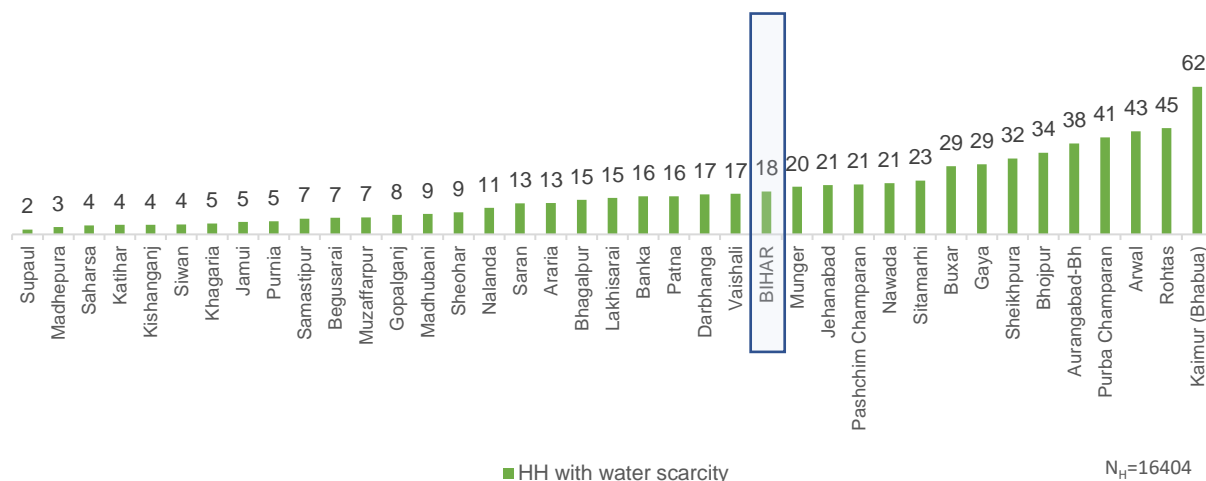
Figure 35: Households reported to use of booster pumps



E. Households who faced shortage of water

In the state, **18 percent HHs** faced shortage of water during any time of the year, while **14 percent HHs** reported having some mechanism to cope with scarcity of water.

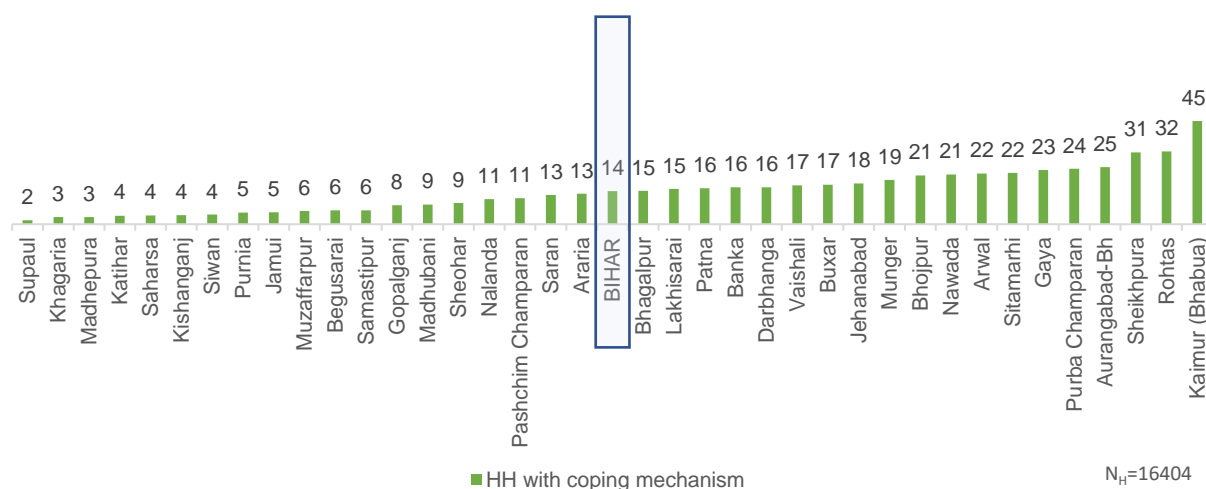
Figure 36: Households who faced water scarcity



F. Household with coping mechanism during scarcity of water

14% HHs reported having some mechanism to cope with scarcity of water.

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

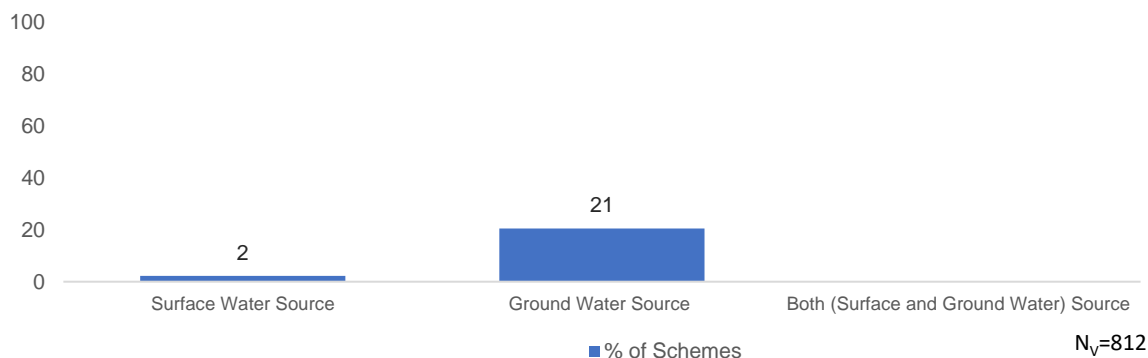


3.5. Source sustainability at the village level

Schemes based on surface and ground water

2% of schemes reported to be based on surface water source while **21% of schemes** reported to be based of ground water sources.

Figure 38: Schemes based on water source in village

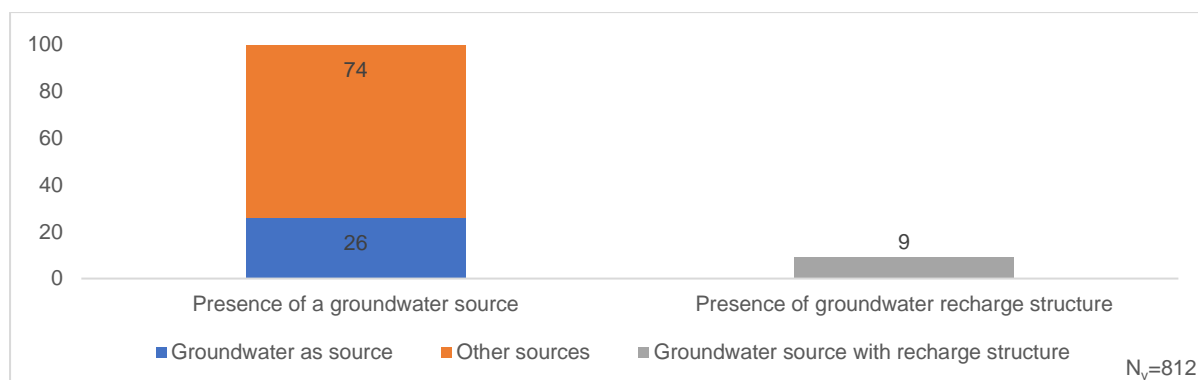


*'Surface Water Source' is Stream, Spring, Glacier, River, lake, pond etc. and Groundwater Source is open well, borewell, tube well, handpump, spring, etc.

Villages reported having presence of a groundwater source

In the state, **26 percent villages** reported the presence of groundwater sources like improved dug wells and borewells. Out of which, 9 percent of villages reported (i.e., 76 villages) reported having a recharge structure.

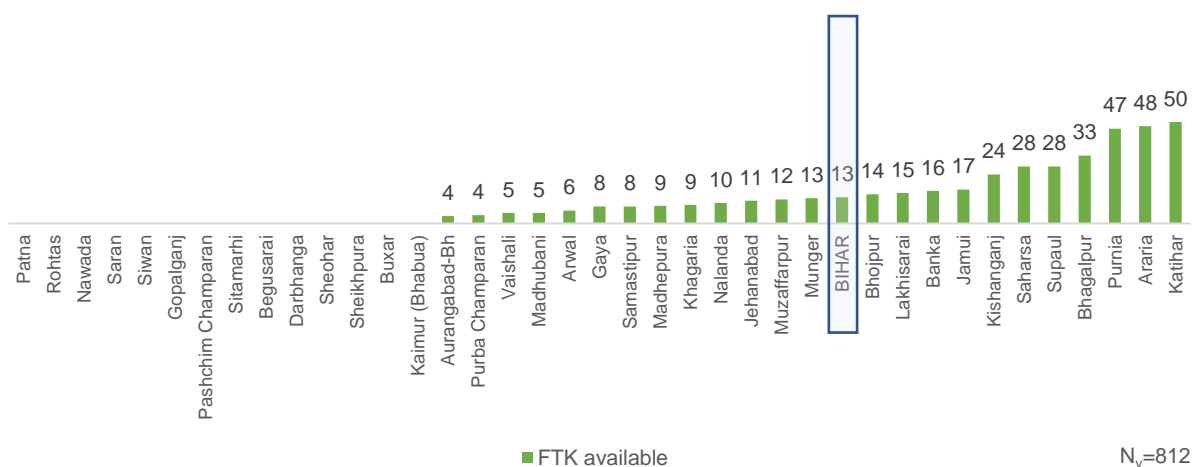
Figure 39: Villages reported the presence of groundwater sources and among those how many reported to have a recharge structure



3.6. Water quality monitoring and surveillance in the villages

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

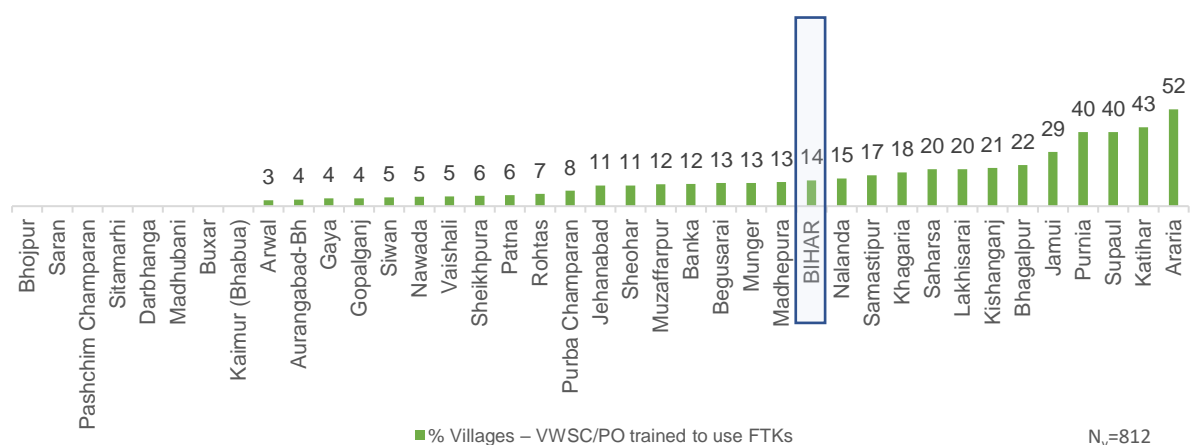
Figure 40: Availability of field test kits with VWSC/ Pani Samiti



With regards to water quality testing in the village by VWSC, 13% villages in the state reported having available field test kits. Katihar reported 50% villages having available field test kits for water quality testing, which was the highest in the state.

B. Persons Samiti trained to use field test kits

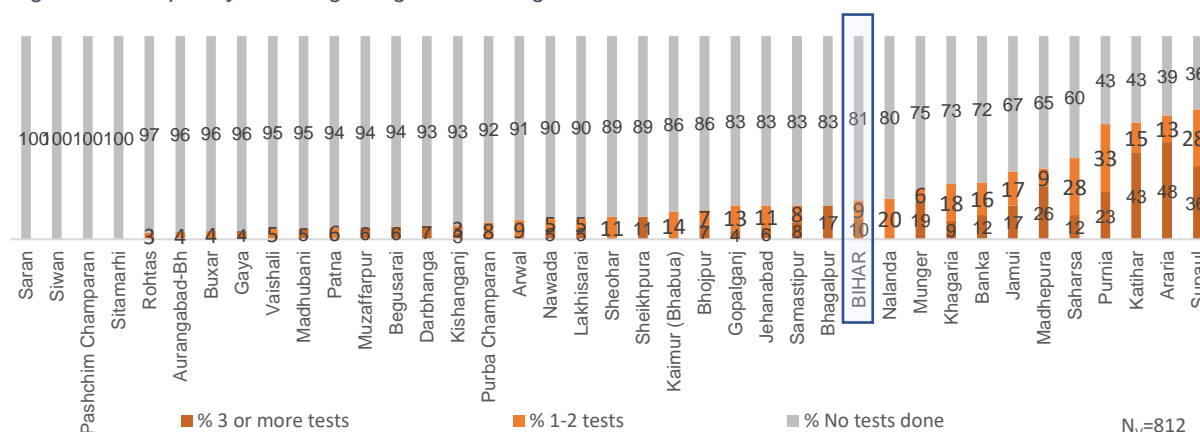
Figure 41: Persons trained to use field test kits



Overall, **14 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. Araria reported 52% VWSC/Pani Samiti or pump operator trained to use field test kits.

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

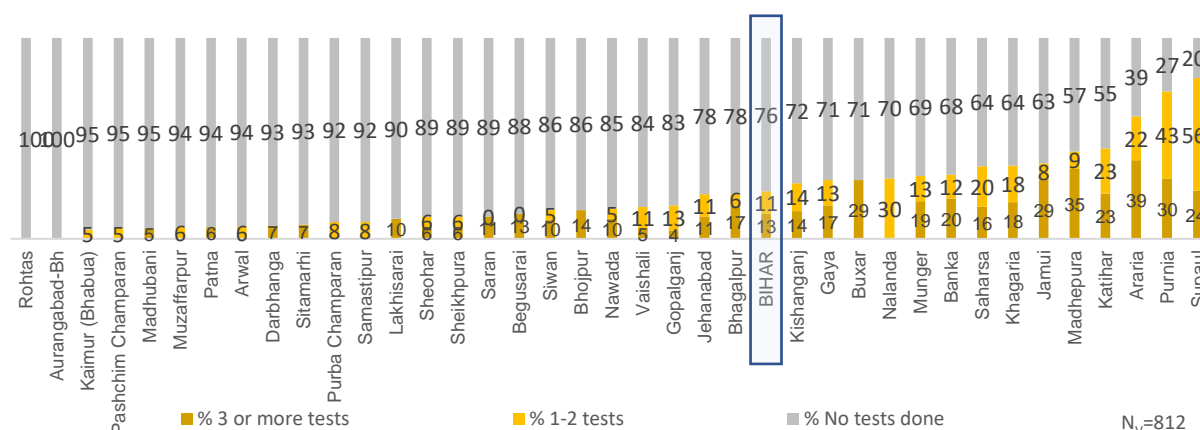
Figure 42: Frequency of testing using FTK in villages



Across the state, about ten percent of the total sampled villages reported that the quality of water (at different points in the respective villages) was checked at least three times using FTKs in last one year. Among the districts, Araria had the highest proportion of such villages, wherein 48% of its villages reported using FTKs three or more times in last one year.

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

Figure 43: Frequency of lab testing

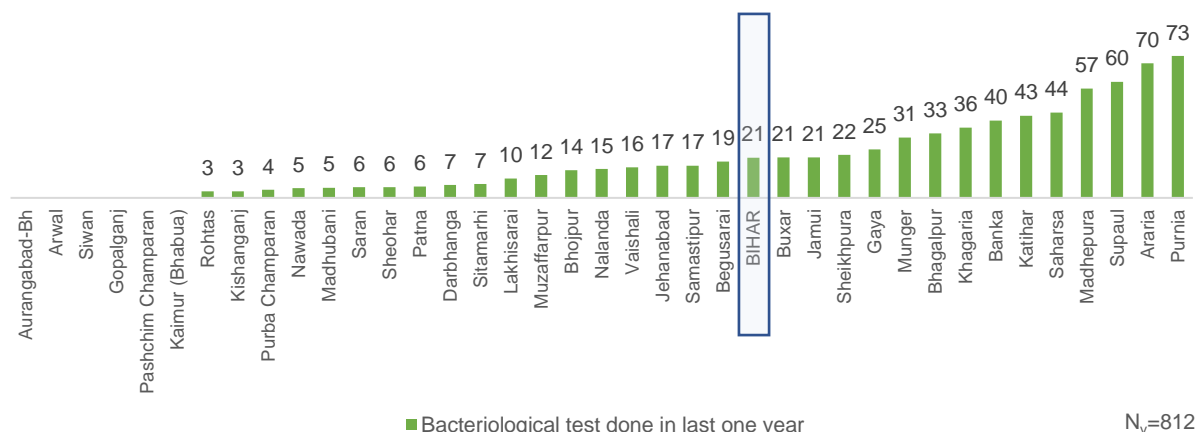


Across the state, less than one-fifth of the total sampled villages (13%) reported that the quality of water (at different points in the respective villages) was checked at least three times through laboratories in last one year. Among the districts, Araria had the highest proportion of such villages, wherein 39% 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, **21 percent villages** in the state reported having bacteriological test done in the last one year.

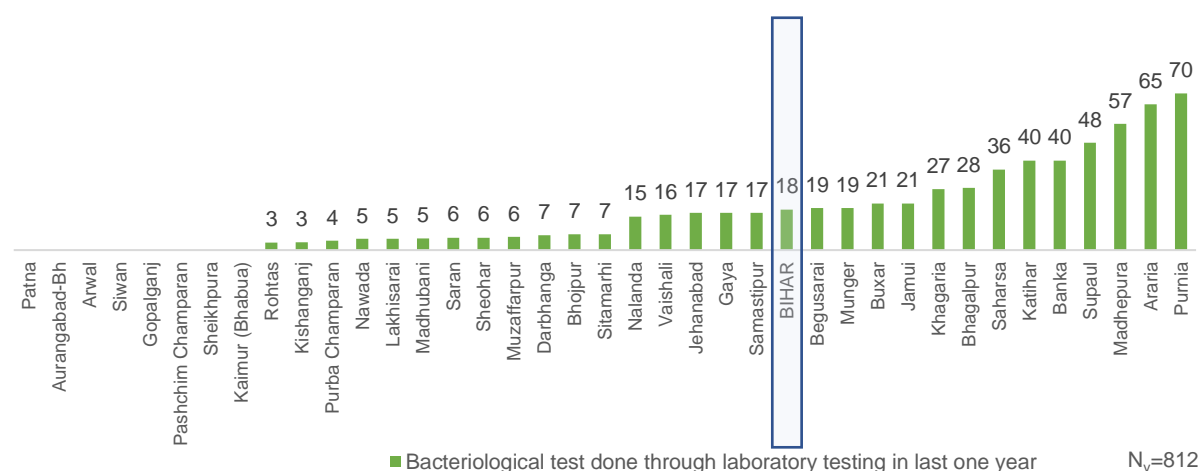
Figure 44: Percent villages in which Bacteriological test was done in the last one year



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

Laboratory based bacteriological tests, in last one year, was reported by 18 percent of sampled villages. 70 percent sampled villages from the district Purnia reported to have had bacteriological tests done through laboratories in last one year.

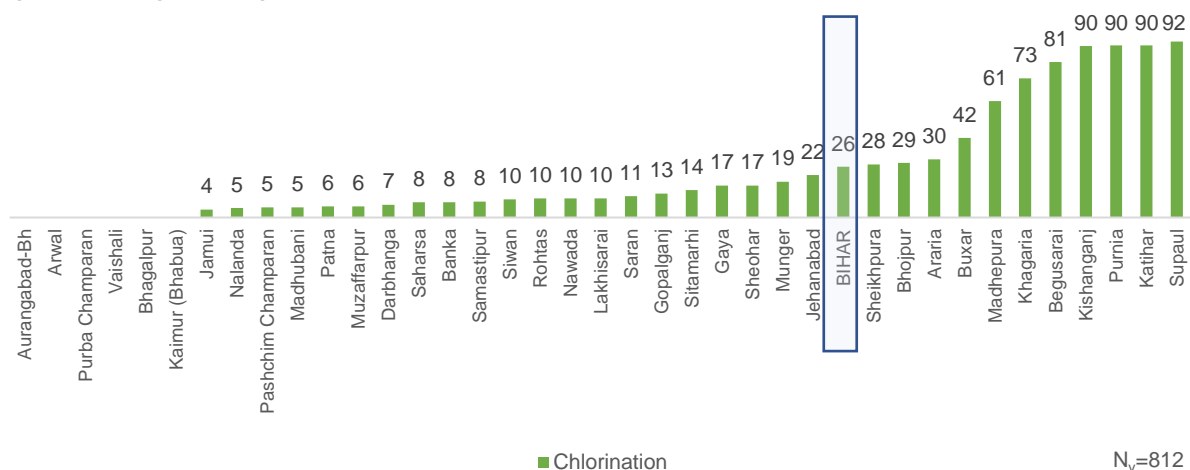
Figure 45: Bacteriological test done through laboratory testing in the last one year



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

More than **26 percent villages** reported that there is availability of chlorination mechanism in the village but during onsite testing of water at household level only 4% households tested to have for presence of chlorine.

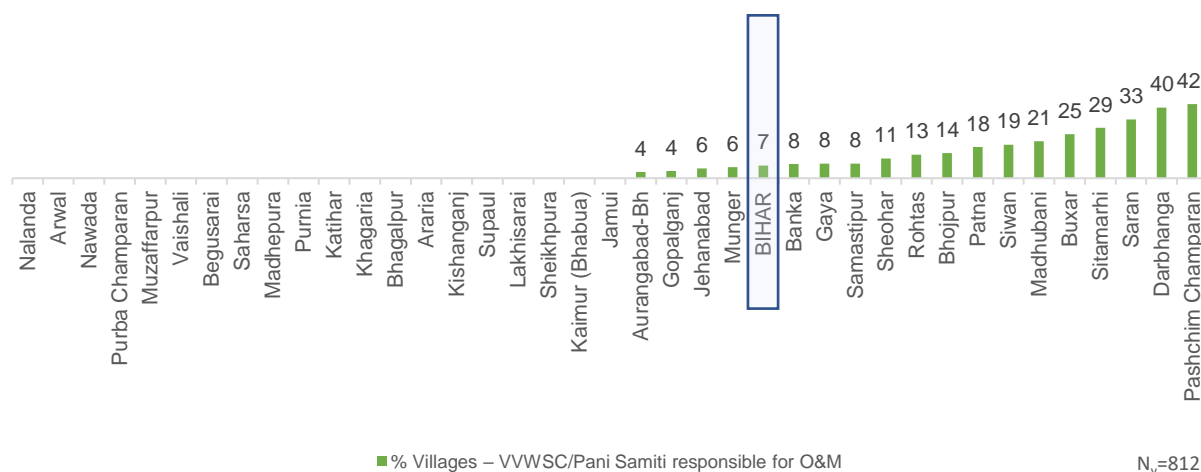
Figure 46: Villages having a mechanism for chlorination



3.7. Management of water service delivery at village level

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

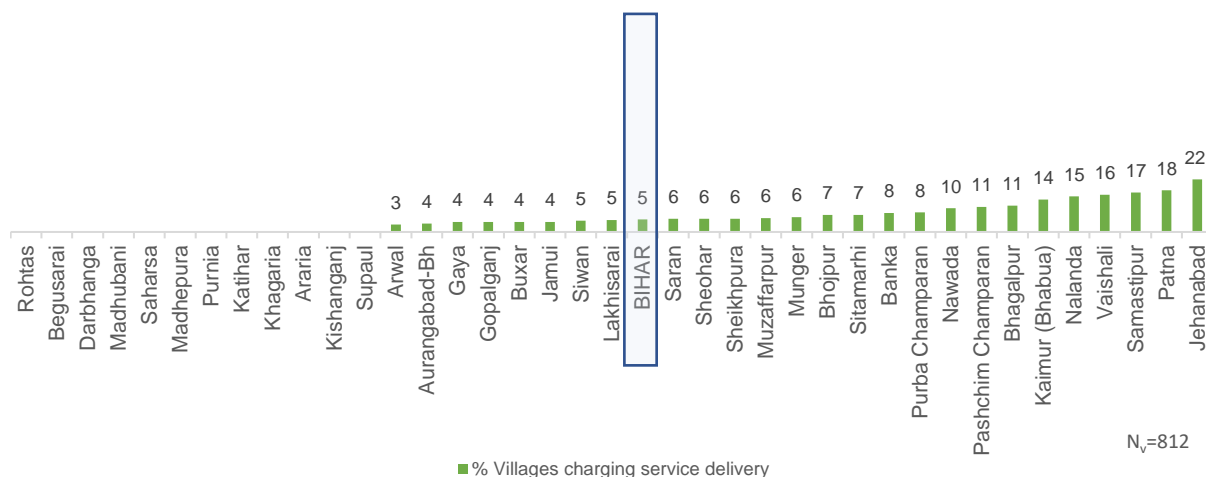
Figure 47: VWSC/Pani Samiti responsibility for O&M of PWS schemes



In the state, **7 percent villages** that have VWSC/Pani Samiti reported to be responsible for operation and maintenance of PWS. Ambala, Yamunanagar, Sonipat, Rohtak, Palwal and Charkhi Dadri districts reported that VWSC/Pani Samiti are not responsible for operation and maintenance of PWS.

B. Villages levying water service delivery charges from households

Figure 48: Villages levying water service delivery charges from households

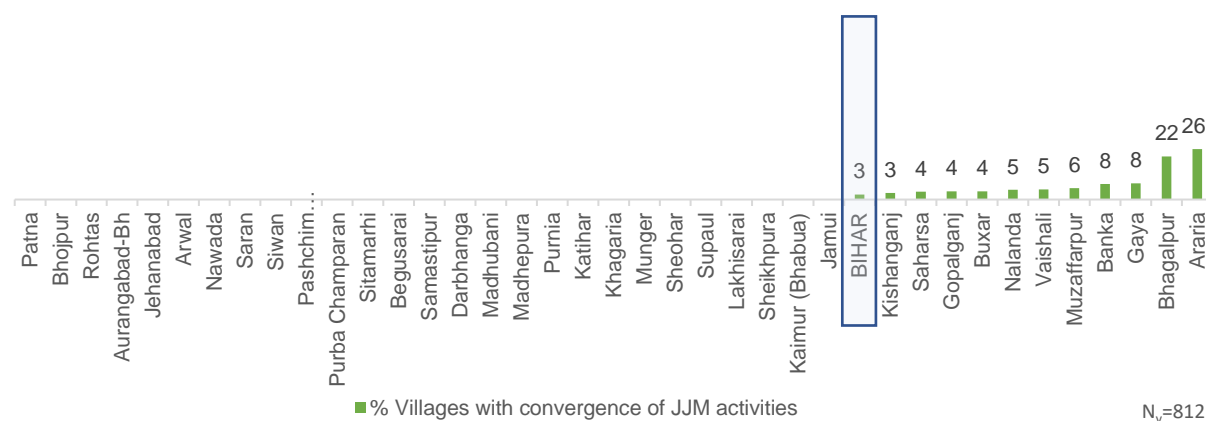


Overall, **5 percent of villages** in the state levy charge for water service delivery to households whereas **6 percent HHs** reported paying water service delivery charges at the households.

C. Convergence of JJM activities with other schemes in villages

In the state, only **3 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.

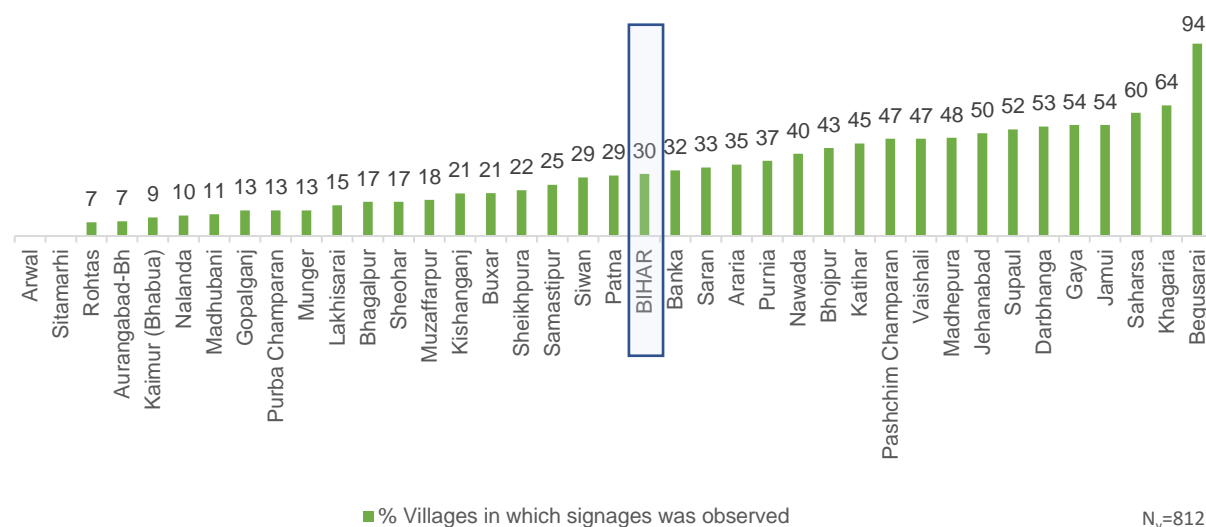
Figure 49: Village reported convergence of JJM activities with other schemes in the village



D. Villages where signages were observed

Signages about JJM were observed in **30 percent** of the sampled villages. District Begusarai had the highest proportion of villages where signages were observed (94%).

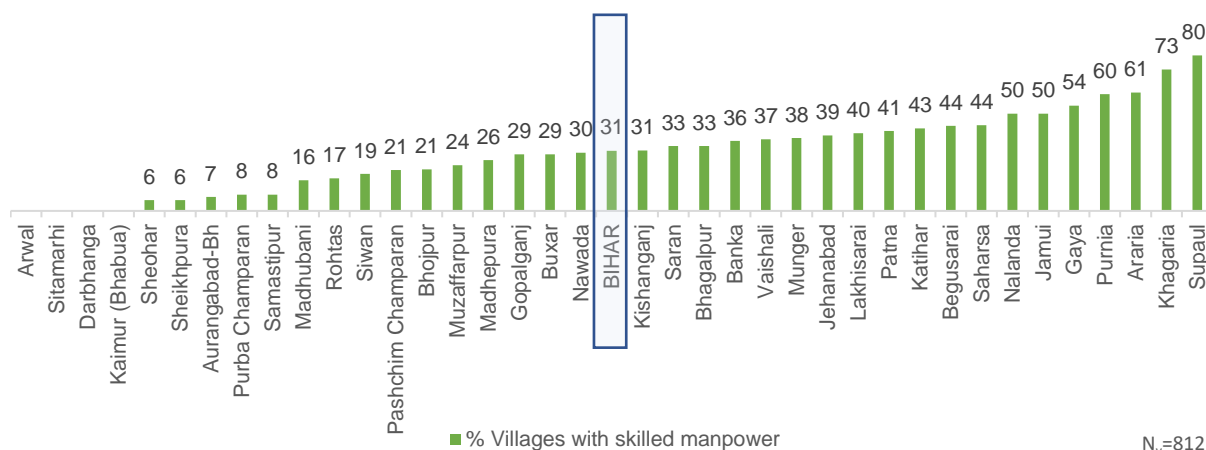
Figure 50: Villages in which signages about JJM was observed



3.8. Status of Operation & Maintenance

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

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

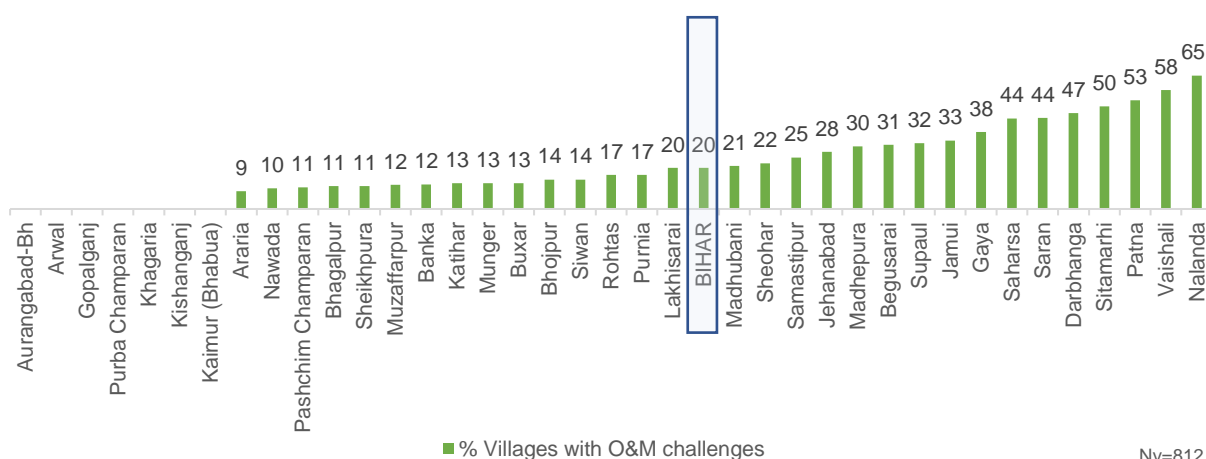


Across the state, **31 percent villages** in the reported having identified skilled manpower for O&M of PWS schemes, the most reported to be in Supaul (80%) and the least in Sheohar and Sheikhpura (6%). Arwal, Sitamarhi, Darbhanga, and Kaimur (Bhabua) reported none.

B. Villages with O&M challenges

In the state, **20 percent of villages** in the state reported to have faced challenges with respect to O&M of PWS schemes.

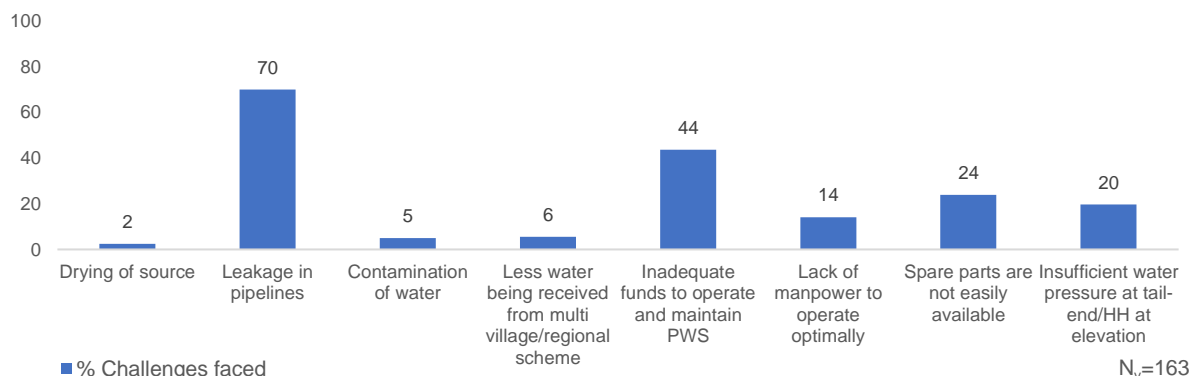
Figure 52: Villages reported having faced O&M challenge



C. Details of challenges faced

Out of the **20 percent** of villages that had faced challenges with respect to O&M of PWS schemes (163 villages), 'leakage in pipelines' was attributed the most – at 70%.

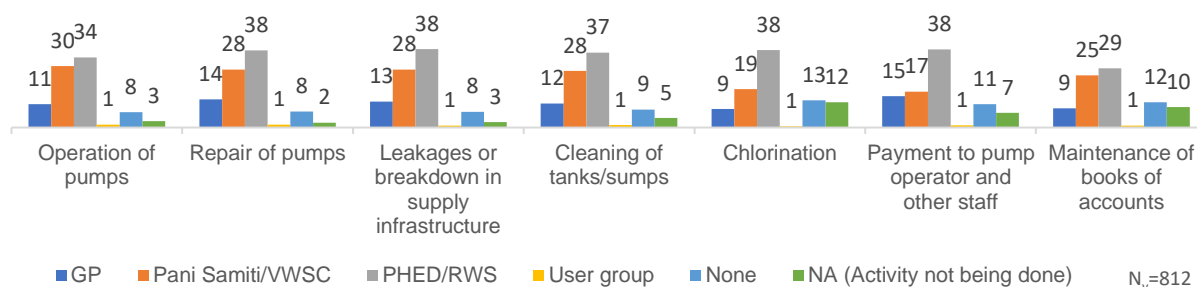
Figure 53: Details of O&M challenges faced by village



D. Responsible for O&M

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

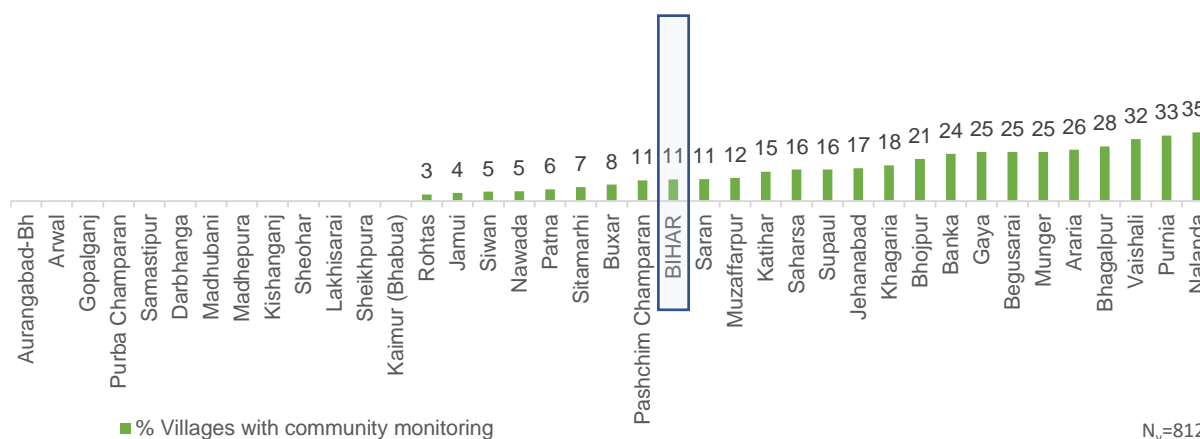
Figure 54: Responsibilities taken up by different bodies regarding O&M



E. Villages with community level monitoring of water wastage

11% of villages in the state reported to have community level monitoring of water wastage

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



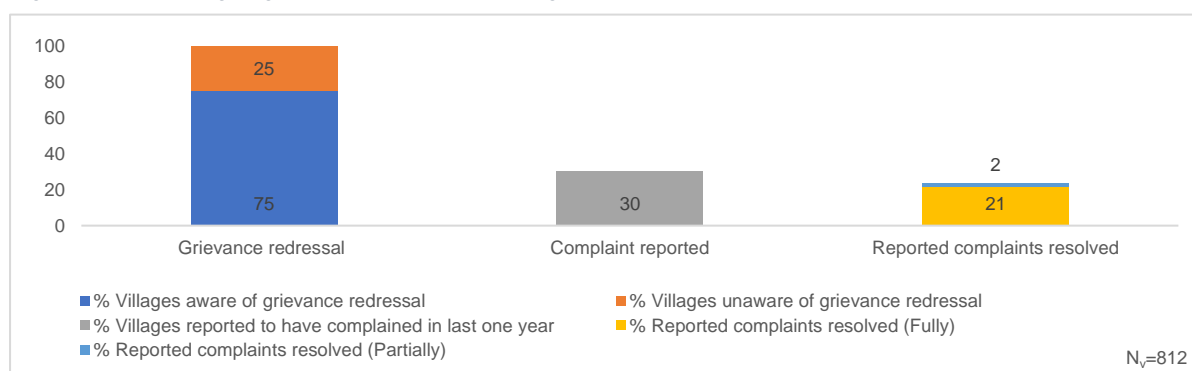
3.9. Status of service delivery related grievances and redressal

A. Village level

Grievance redressal at village

In the state, **75 percent of villages** reported that they are aware of any grievance redressal mechanism, but only 30 percent HHs have reported a complaint in the last one year amongst which 21 percent reported that the complaints are fully resolved while 2 percent of complaints have been partially resolved.

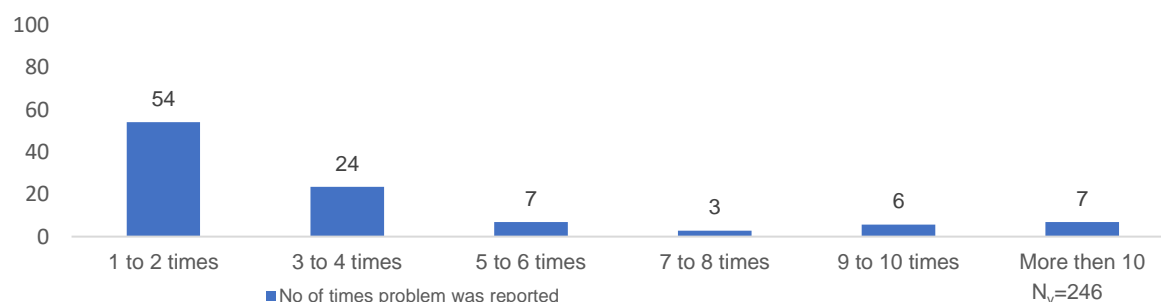
Figure 56: Reporting of grievance redressal at village level



Problem reported in last 1 year

Among the villages who reported a complaint (i.e. 246 villages), 7% villages have reported a complaint more than 10 times in the last one year, while 54 percent reported a complaint at least once or twice.

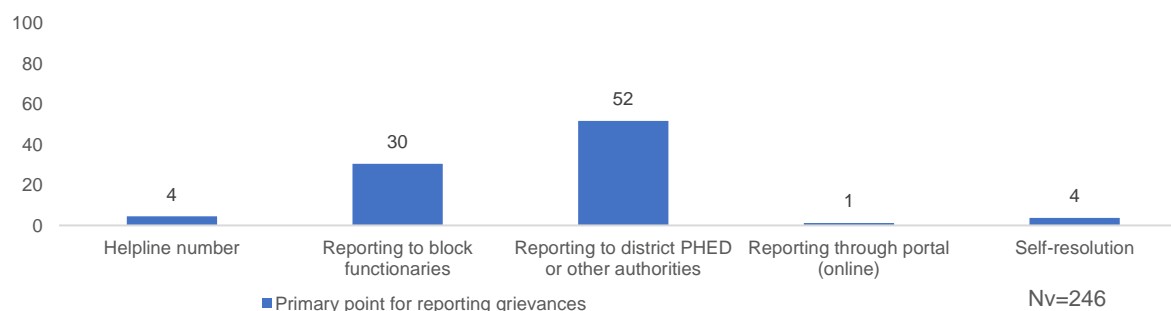
Figure 57: Number of times villages have reported grievance in last 1 year



Primary points for reporting grievances

Among those who reported complaint (i.e., 30% HHs, 246 villages), **52 percent of villages** reported that they report their grievances to **PHED** beside other reporting-points.

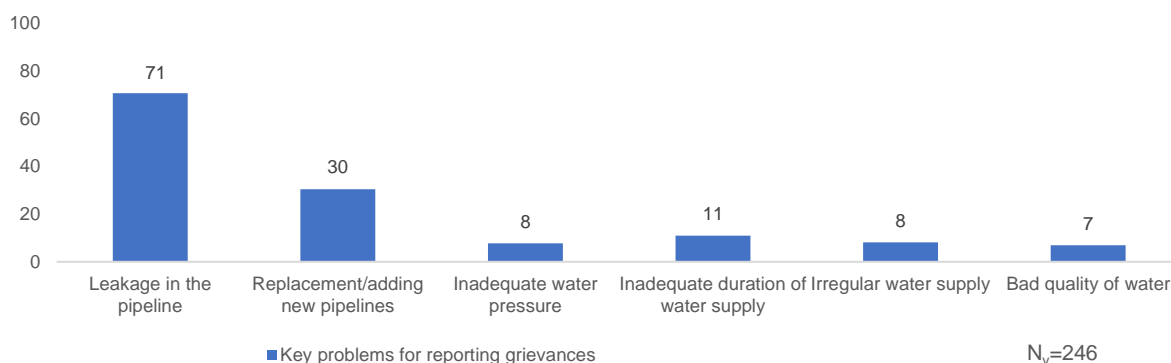
Figure 58: Primary points for reporting grievances by village



Primary points for reporting grievances key problems

Overall, among those who reported complaint (i.e., 56% HHs, 246 villages) **71 percent of villages** reported that **leakage in the pipeline** is their most encountered problem for reporting grievances

Figure 59: Key problems reported by village

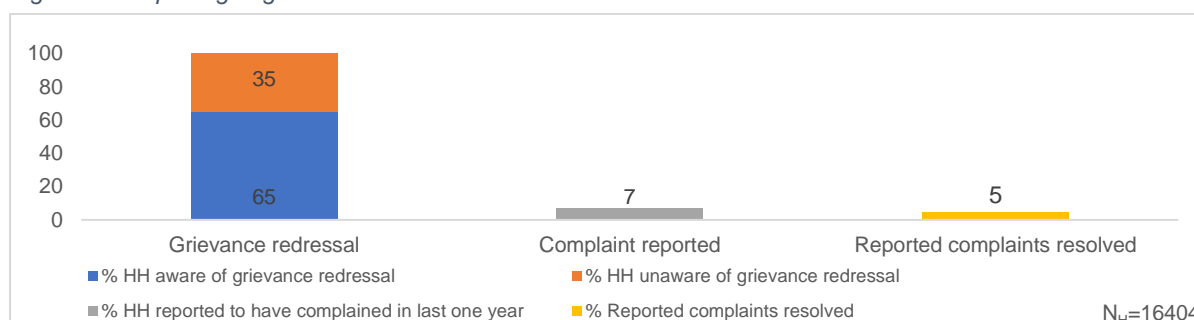


B. Household level

Awareness of grievance redressal at household

In the state, **65 percent of HHs** reported that they are aware of any grievance redressal mechanism w.r.t. HH tap water through PWS, but only 7 percent HHs have reported a complaint in the last one year and only 5 percent of complaints have been resolved.

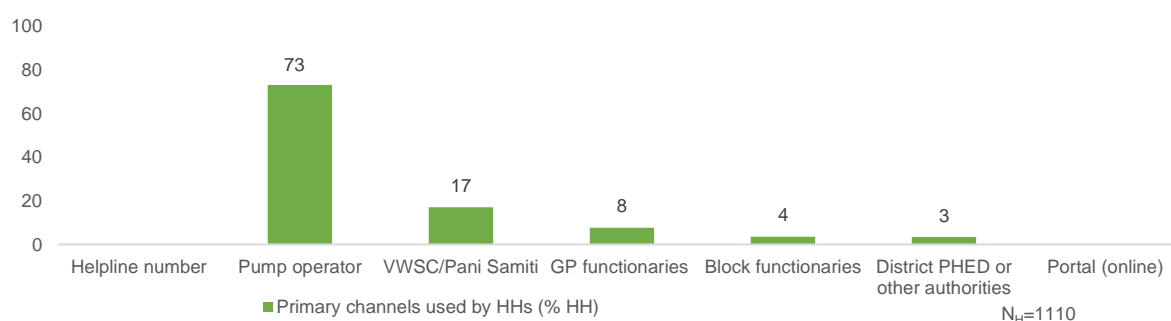
Figure 60: Reporting of grievance redressal at household level



Primary channels for reporting grievances by households

Among those who reported complaint as shown in the above graph (i.e., 7% HHs, 1110 HHs), **73 percent** of the HHs reported their complaints to the **pump operators** beside other reporting-channels

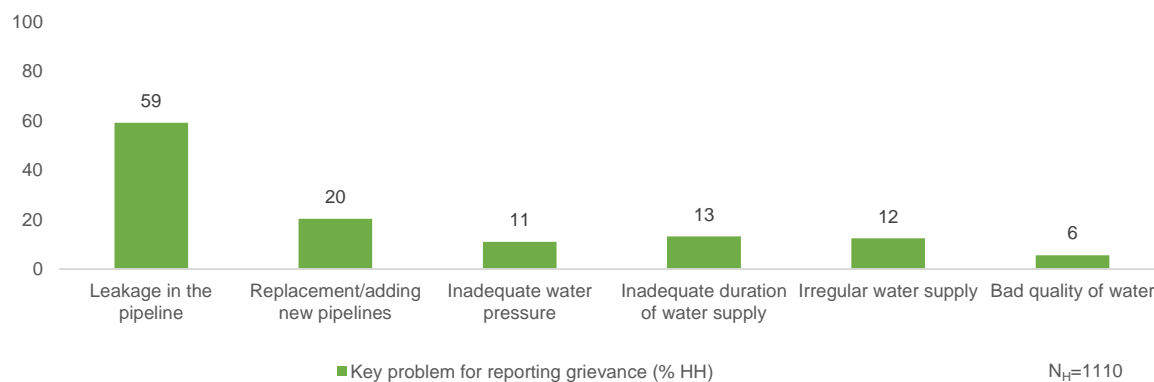
Figure 61: Primary channels for reporting grievances by households



Key problems for reporting grievances

Overall, among those who reported complaint (i.e., 7% HHs, 1110 HHs) **59 percent** of the HHs that reported problems was of **leakage in the pipeline** beside other problems

Figure 62: Key problems reported by households

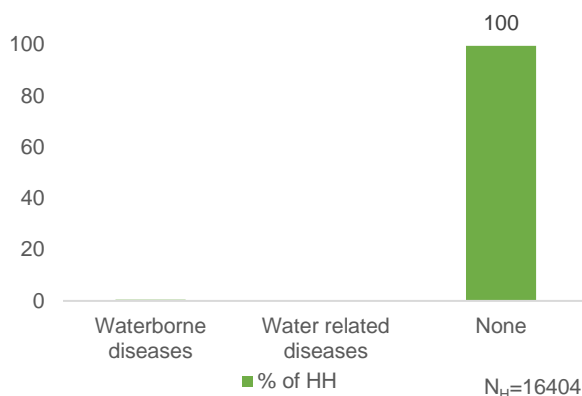


3.10. Perception of HHs on Outcome Indicators

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

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

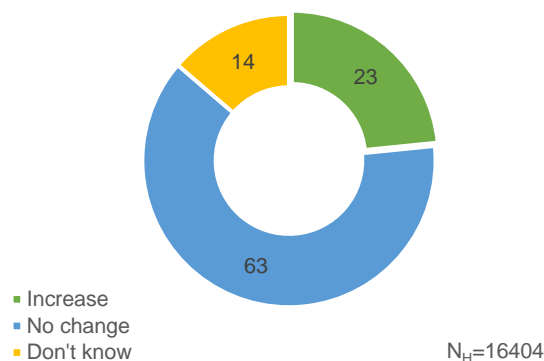
Figure 64: Household reported incidence of water borne diseases in last one year



B. Change in employment days since FHTC programmes/schemes

Since having a functional HH tap connection, 23 percent HHs across the state has reported that there has been a change in the no. of employment days of the adult HH members while 63 percent HHs reported no change

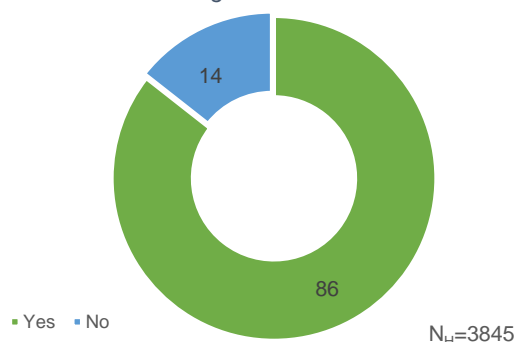
Figure 63: Household reported a change in employment days since FHTC programmes /schemes



C. Reduction in time and effort in collecting water

Out of the HHs reported (i.e., 3845) that female members used to fetch water before HH tap connection, 86 percent reported that post installation of HH tap connection it helped reduction of time and effort in collection of water

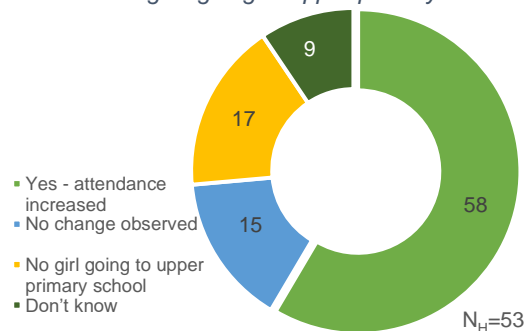
Figure 66: Households reported reduction in time and effort in collecting water



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

Across the state, 58 percent HHs reported that since having a functional HH tap connection the attendance of the girls going to schools increased, while 15 percent 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.

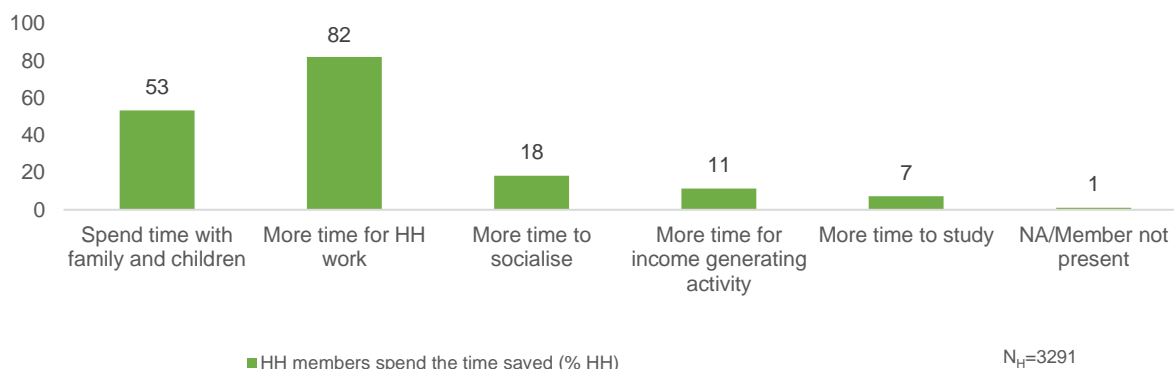
Figure 65: Households reported increase of attendance of girls going to upper primary school



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

Time saved by female HH members against collecting water, post installation of HH tap connections, was reportedly most utilized for other HH work (82%).

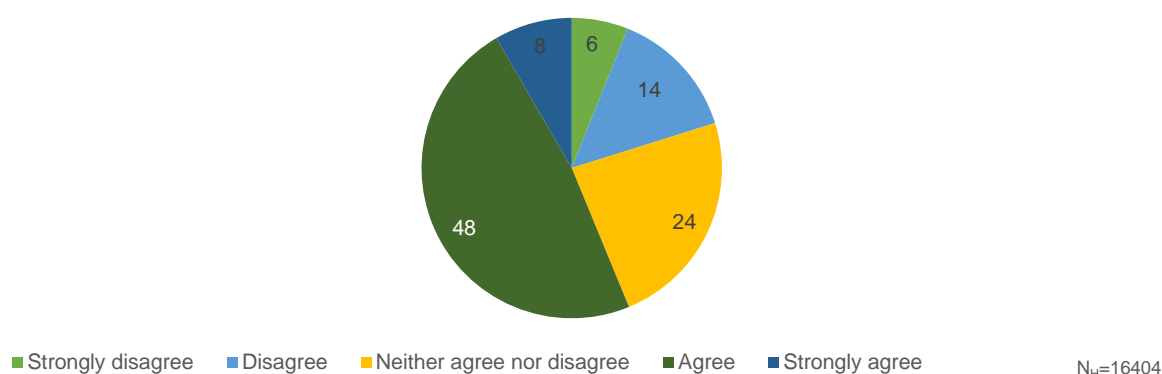
Figure 67: Utilization of time saved by households post installation of HH tap connection



F. Change in social status

Sense of pride and positive change in social status was reportedly realized by 72 percent of HHs post the installation of HH tap connections.

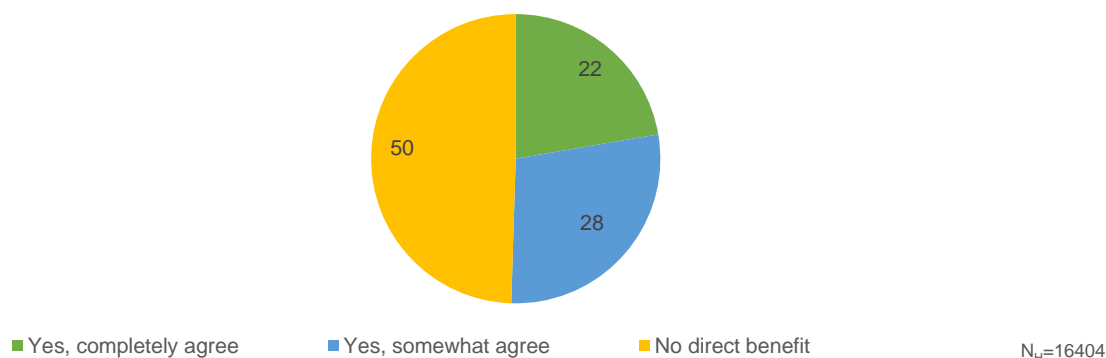
Figure 68: Households reported to have a positive change in social status








G. Direct benefits in terms of income due to FHTC

Across the state, 22 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 28% HHs reported being in partial agreement against the same.

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



3.11. User satisfaction

Table No. 7: User satisfaction - more than 75% happy with FHTC services			
S. No.	Parameter (N _h =16404)		In %
1	Regularity		89.4
2	Overall quality		88.1
3	Colour		89.7
4	Taste		89.0
5	Odour		89.4

Note:

Base (N_v)=812 means all villages sampled and covered in Bihar state

Base (N_H)=16404 means all households sampled and covered across the 812 villages in Bihar state

Base (N_H)=14552 means all households sampled where water sample be collected across the 812 villages in Bihar state

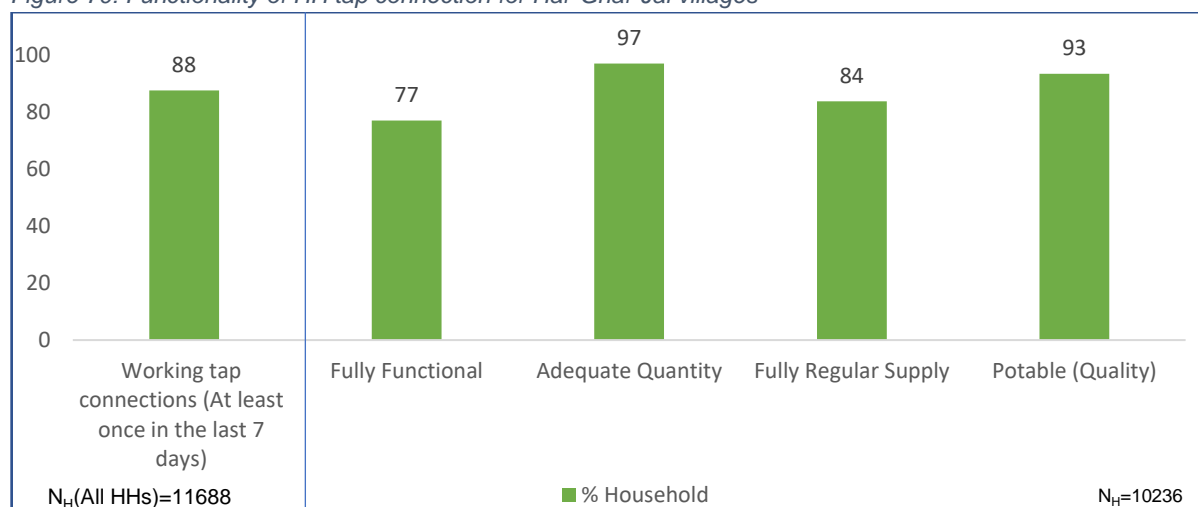
Base (N_H)=3845 means all households sampled where female members used to fetch water before HH tap connection

Base (N_H)=53 means all households sampled that had adolescent girls as one of HH members

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

4.1. Overall Functionality (in %)

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



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

Please note: For HGJ district, N_H=10236 implies all HHs where water was found on the day of the survey.

It has been found that 88 percent of the sampled HHs (N=11688) had working tap connections. 77 percent HHs in the state were found to have fully functional HH tap water connection. Almost all households (97 percent) received adequate quantity (≥ 55 LPCD) of water supply and more than 4 out of 5 received regular supply (84 percent) of water. The on-site testing and lab test results of the water indicates that more than 9 out of 10 (93%) sampled households in the state receive potable water.

Table No. 8: Quantity, Regularity, and Quality of FHTC for Har Ghar Jal districts (%HH)						
S. No.	District	Working tap connections (HHs which received water through FHTC at least once in the last 7 days) (% HH)	Fully functional (% HH)	Adequate Quantity (% HH)	Full Regular Supply (% HH)	Potable (Quality) (% HH)
1.	Muzaffarpur	100	81	97	83	97
2.	Samastipur	100	89	99	89	100
3.	Saharsa	100	86	100	98	88
4.	Lakhisarai	100	76	97	83	94
5.	Jamui	100	86	90	94	100
6.	Nalanda	99	84	100	89	94
7.	Begusarai	99	86	100	87	99
8.	Bhagalpur	99	93	99	96	98
9.	Sheohar	99	72	99	73	98
10.	Madhepura	98	94	97	97	100
11.	Khagaria	98	95	100	95	100
12.	Kishanganj	98	87	100	98	89
13.	Nawada	97	77	100	87	89
14.	Katihar	97	77	96	80	100
15.	Munger	97	89	99	92	98
16.	Sheikhpura	97	79	99	84	95
17.	Saran	96	82	97	84	100

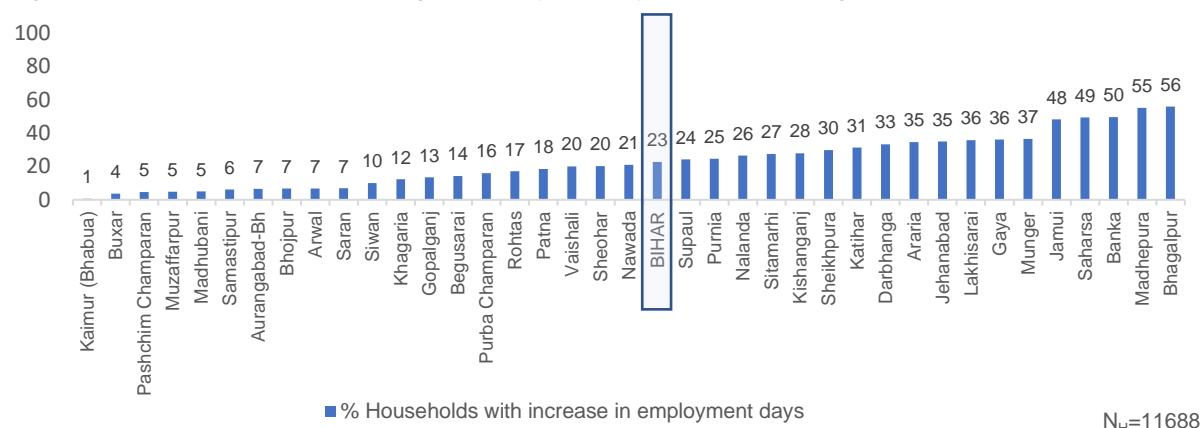
Table No. 8: Quantity, Regularity, and Quality of FHTC for Har Ghar Jal districts (%HH)						
S. No.	District	Working tap connections (HHs which received water through FHTC at least once in the last 7 days) (% HH)	Fully functional (% HH)	Adequate Quantity (% HH)	Full Regular Supply (% HH)	Potable (Quality) (% HH)
18.	Gopalganj	96	83	98	86	99
19.	Gaya	95	59	98	63	98
20.	Supaul	95	96	100	98	98
21.	Jehanabad	93	6	98	65	9
22.	Siwan	93	70	94	82	94
23.	Darbhanga	92	87	100	87	99
24.	Madhubani	91	81	97	90	84
25.	Purnia	91	83	100	84	99
26.	Bhojpur	90	68	95	72	94
27.	Vaishali	89	81	100	83	99
28.	BIHAR	88	77	97	84	93
29.	Patna	87	81	99	86	96
30.	Banka	87	95	100	99	96
31.	Sitamarhi	85	67	81	69	98
32.	Araria	84	100	100	100	100
33.	Buxar	83	71	100	73	98
34.	Aurangabad-Bh	71	71	93	80	92
35.	Pashchim Champaran	71	70	91	79	94
36.	Purba Champaran	64	95	99	99	96
37.	Rohtas	57	66	98	80	81
38.	Arwal	54	74	92	78	99
39.	Kaimur (Bhabua)	43	58	88	62	98
# 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, more than one-fifth (23%) of the sampled households reported that employment days increased since the installation of FHTC.

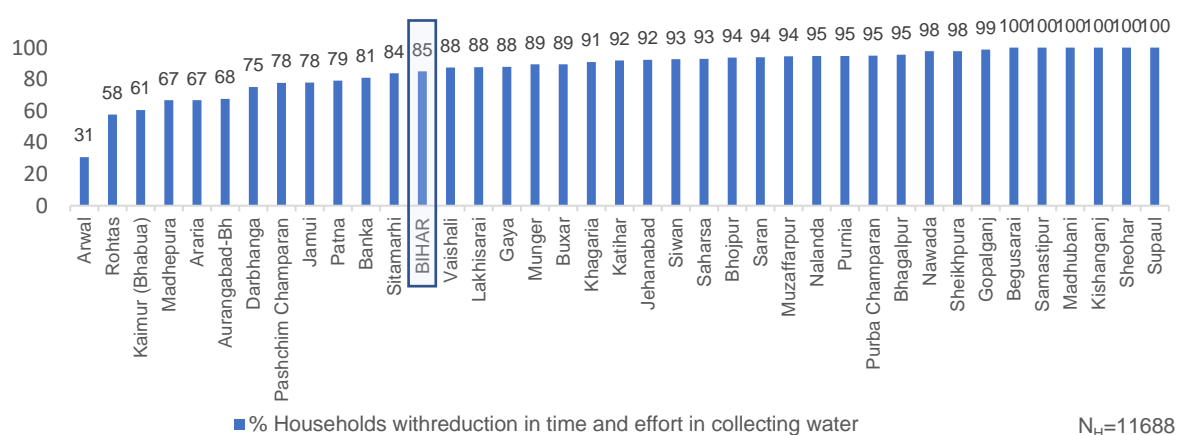
Figure 71: Household reported a change in employment days since FHTC programmes /schemes in HGJ districts



B. Reduction in time and effort in collecting water

Similarly, about 85 percent of the sampled households also reported that the effort and time in collecting water reduced after installation of FHTC.

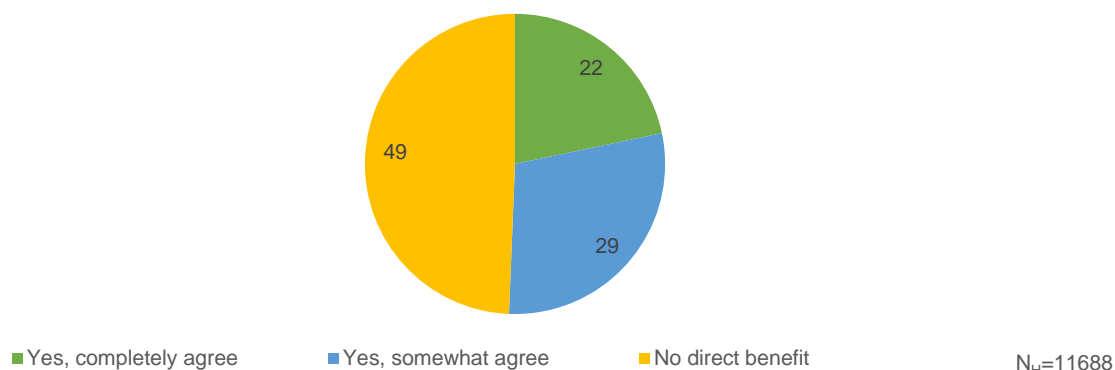
Figure 72: Households reported reduction in time and effort in collecting water in HGJ districts



4.3. Direct benefits in terms of income due to FHTC

Across the state, 22 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 49 percent reported being in partial agreement against the same.

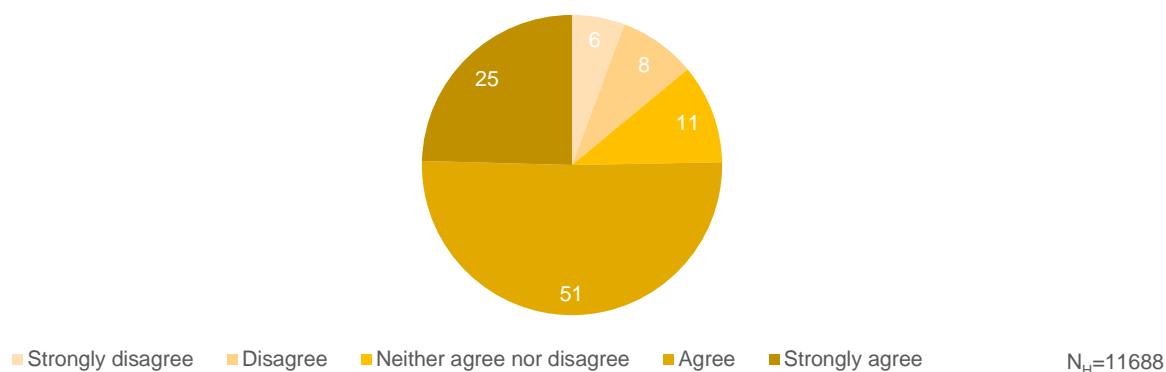
Figure 73: Households reported to have received direct benefits in terms of income due to FHTC in HGJ districts



4.4. Change in social status

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

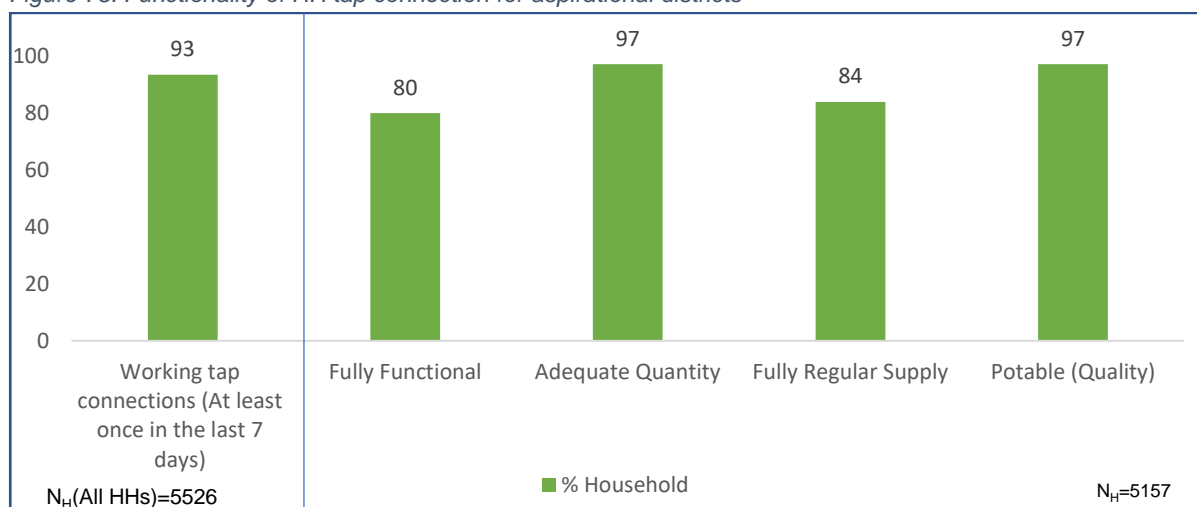
Figure 74: Households reported to have a positive change in social status in HGJ districts



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

5.1. Overall Functionality (in %)

Figure 75: Functionality of HH tap connection for aspirational districts



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

Please note: For aspirational districts, N_H=5157 implies all HHs where water was found on the day of the survey.

It has been found that 93 percent of the sampled HHs (N=5157) had working tap connections. 80 percent HHs in the state were found to have fully functional HH tap water connection. Almost all households (97 percent) received adequate quantity (≥ 55 LPCD) of water supply and more than 4 out of 5 received regular supply (84 percent) of water. The on-site testing and lab test results of the water indicates that more than 9 out of 10 (97%) 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.	Muzaffarpur	100	82	97	84	97
2.	Jamui	100	82	93	95	94
3.	Begusarai	99	86	100	86	99
4.	Sheikhpura	98	78	99	81	98
5.	Katihar	97	79	98	81	100
6.	Khagaria	97	87	99	88	100
7.	Nawada	96	76	99	85	91
8.	Gaya	95	59	98	63	98
9.	BIHAR	93	80	97	84	97
10.	Purnia	92	81	100	82	99
11.	Banka	89	95	100	98	97
12.	Sitamarhi	87	69	84	70	99
13.	Araria	83	97	100	98	99
14.	Aurangabad-Bh	79	72	95	82	92

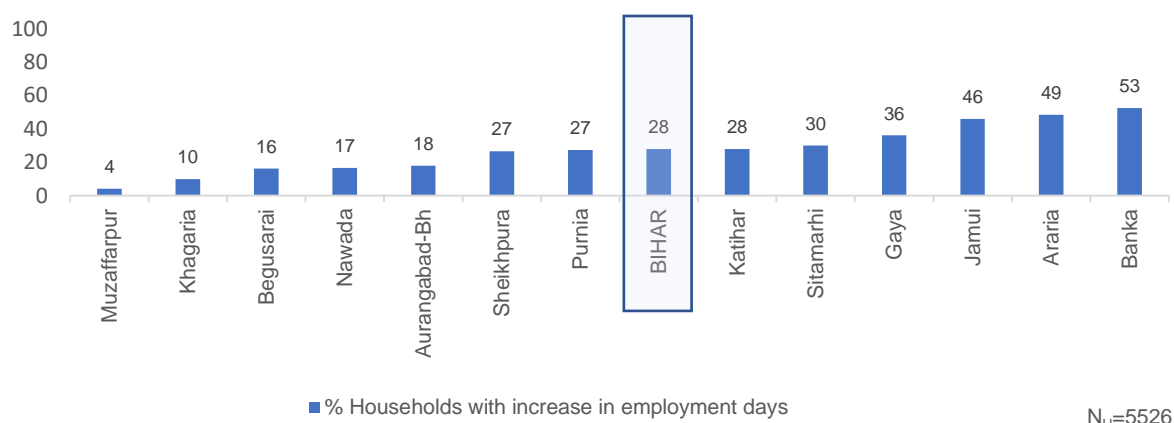
Potable water has been considered basis testing of water samples through laboratory tests for physical, chemical, and bacteriological as given in Table 5 parameters (within acceptable/ permissible range) and onsite testing of pH. The details of laboratory test are mentioned in the table given above in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

5.2. Perception of HHs from aspirational districts on Outcome Indicators

A. Change in employment days since FHTC programmes/ schemes

Around 28 percent of the households in aspirational districts reported increase in employment days since installation of FHTC.

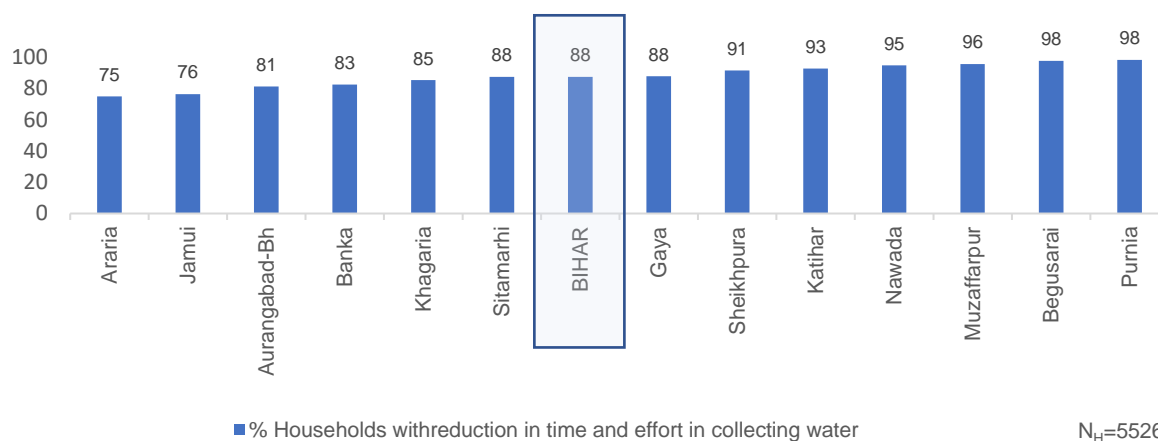
Figure 76: Household reported a change in employment days since FHTC programmes /schemes in Aspirational districts



B. Reduction in time and effort in collecting water

Around 88 percent of the households in aspirational districts reported reduction in time and effort in collecting water.

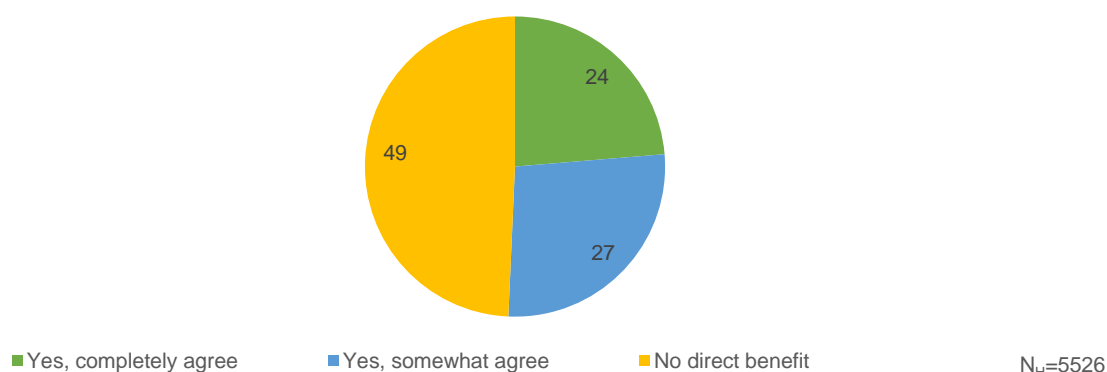
Figure 77: Households reported reduction in time and effort in collecting water in Aspirational districts



5.3. Direct benefits in terms of income due to FHTC

Across the state, 24 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 27 percent reported being in partial agreement against the same.

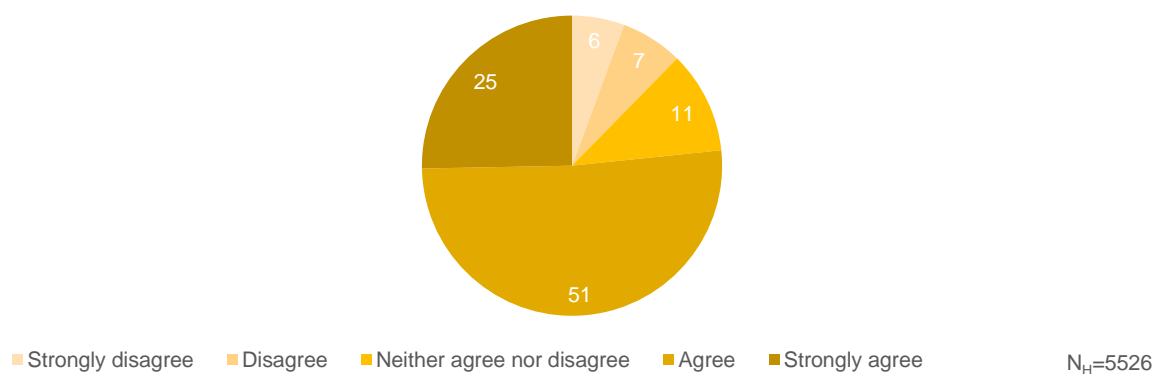
Figure 78: Households reported to have received direct benefits in terms of income due to FHTC in Aspirational districts



5.4. Change in social status

More than three-fourth (76%) 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.

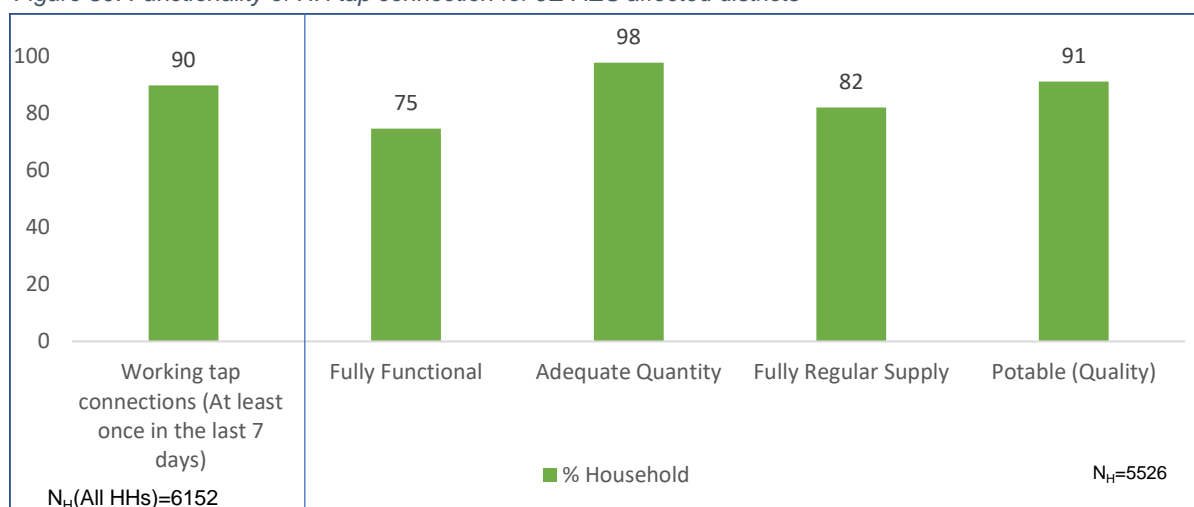
Figure 79: Households reported to have a positive change in social status in Aspirational districts



6. Functionality status of FHTC at household level for JE-AES districts

6.1. Overall Functionality (in %)

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



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

Please note: For JE-AES districts, N_H=5526 implies all HHs where water was found on the day of the survey.

It has been found that 90 percent of the sampled HHs (N=5526) had working tap connections. 75 percent HHs in the state were found to have fully functional HH tap water connection. Almost all households (98 percent) received adequate quantity (≥ 55 LPCD) of water supply and more than 4 out of 5 received regular supply (82 percent) of water. The on-site testing and lab test results of the water indicates that more than 9 out of 10 (91%) sampled households in the state receive potable water.

Table No. 10: Quantity, Regularity, and Quality of FHTC for JE-AES affected 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.	Muzaffarpur	100	82	97	84	97
2.	Samastipur	100	88	98	89	100
3.	Nalanda	99	84	100	89	94
4.	Nawada	96	76	99	85	91
5.	Gopalganj	96	83	98	86	99
6.	Gaya	95	59	98	63	98
7.	Jehanabad	94	6	98	65	9
8.	Siwan	94	74	95	82	95
9.	Darbhanga	93	77	97	78	100
10.	Saran	92	83	97	84	100
11.	Patna	90	80	99	83	97
12.	BIHAR	90	75	98	82	91
13.	Vaishali	89	81	100	83	99
14.	Araria	83	97	100	98	99
15.	Pashchim Champaran	74	73	93	81	95
16.	Purba Champaran	53	83	97	88	95

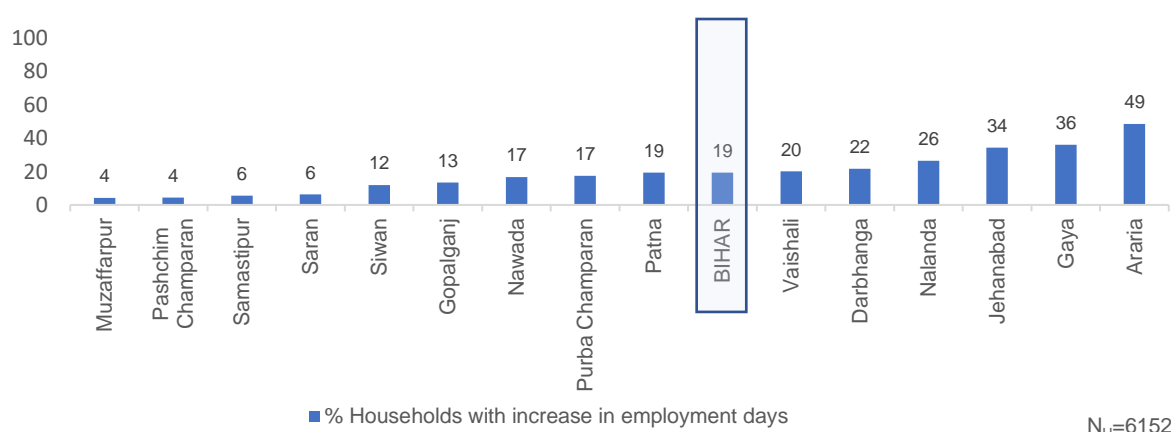
Table No. 10: Quantity, Regularity, and Quality of FHTC for JE-AES affected districts (%HH)						
S. No.	District	Working tap connections (HHs which received water through FHTC at least once in the last 7 days) (% HH)	Fully functional (% HH)	Adequate Quantity (% HH)	Full Regular Supply (% HH)	Potable (Quality) (% HH)
# Potable water has been considered basis testing of water samples through laboratory tests for physical, chemical, and bacteriological as given in Table 5 parameters (within acceptable/ permissible range) and onsite testing of pH. The details of laboratory test are mentioned in the table given above in the glossary.						

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

A. Change in employment days since FHTC programmes/ schemes

Around 19 percent of the households in JE-AES districts reported increase in employment days since installation of FHTC.

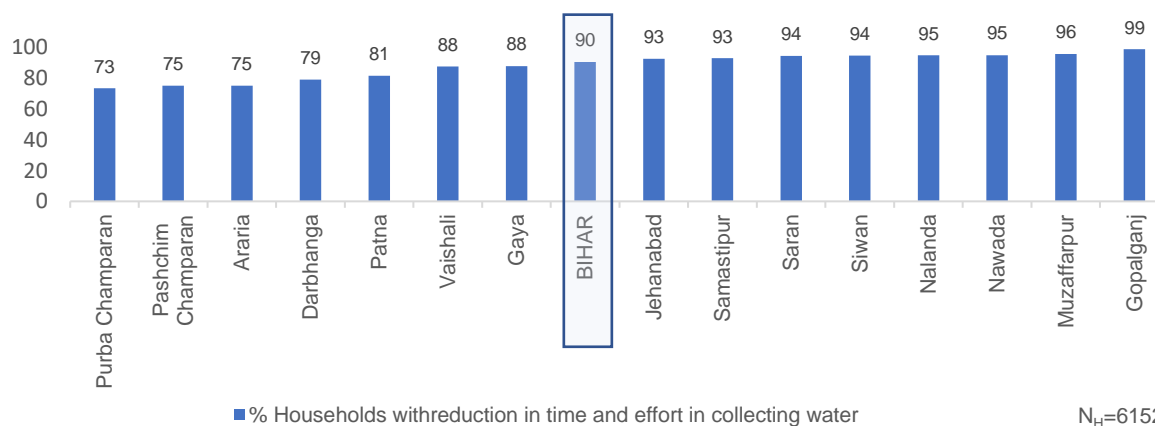
Figure 81: Household reported a change in employment days since FHTC programmes /schemes in JE-AES affected districts



B. Reduction in time and effort in collecting water

Around 90 percent of the households in JE-AES districts reported reduction in time and effort in collecting water.

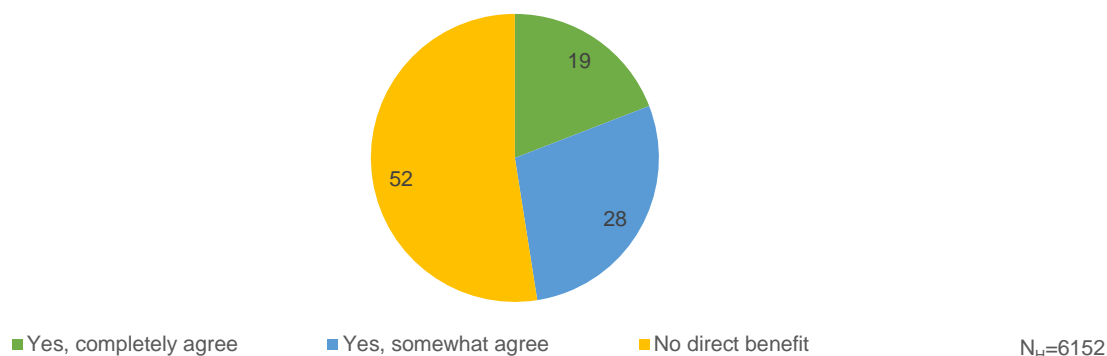
Figure 82: Households reported reduction in time and effort in collecting water in JE-AES affected districts



6.3. Direct benefits in terms of income due to FHTC

Across the state, 19 percent of sampled HHs from JE-AES districts reported being in complete agreement that there had been direct benefits on their HH income since the installation of HH tap connection, while 28 percent reported being in partial agreement against the same.

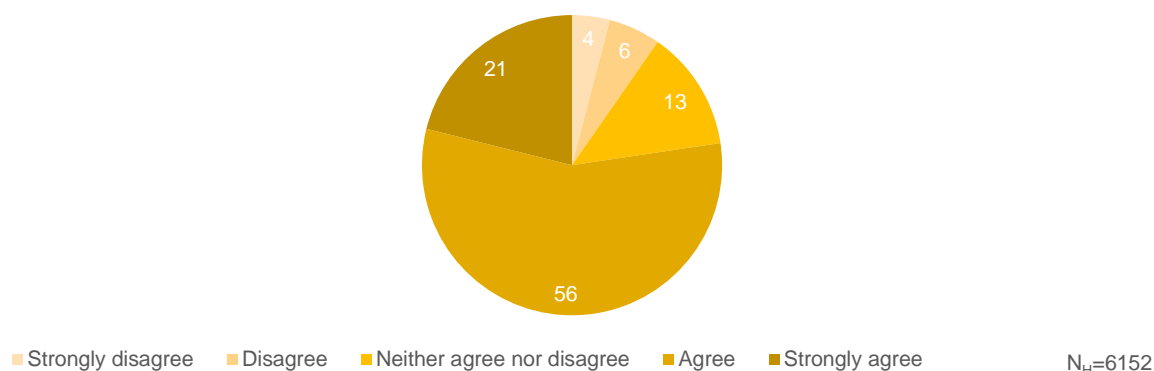
Figure 83: Households reported to have received direct benefits in terms of income due to FHTC in JE-AES affected districts



6.4. Change in social status

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

Figure 84: Households reported to have a positive change in social status in JE-AES affected districts



7. Annexure

Table No. 11: List of replaced villages				
S. No.	District Name	Village Name	Status Of The Scheme (No Scheme/Replaced & Defunct)	Remarks
1	Bhojpur	Pakariabar	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Lachmanpur. Scheme found to be functional in replacement village
2	Bhojpur	Janpuria	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Fatehpur. Scheme found to be functional in replacement village
3	Bhojpur	Chakia	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Agioan. Scheme found to be functional in replacement village
4	Bhojpur	Megharia	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Arallia. Scheme found to be functional in replacement village
5	Rohtas	Mandha	No Scheme / Defunct Scheme	No Scheme present in the sampled village, hence replaced with Village- Konar. Scheme found to be defunct in replacement village
6	Rohtas	Gobardhanpur	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Baskatia. Scheme found to be functional in replacement village
7	Gaya	Dhandhawa	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Dheuri. Scheme found to be functional in replacement village
8	Gaya	Kasiadih	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Debariya. Scheme found to be functional in replacement village
9	Gaya	Ichoi	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Khetra. Scheme found to be functional in replacement village
10	Vaishali	Ababakarpur	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Rampur Bakhtaur. Scheme found to be functional in replacement village
11	Begusarai	Chak Bhelu	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Dihi. Scheme found to be functional in replacement village
12	Begusarai	Dariapur	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Sahna. Scheme found to be functional in replacement village
13	Madhubani	Karmagh	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Balampatti. Scheme found to be functional in replacement village
14	Saharsa	Mamarkha (Mobarakpur)	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Simiri. Scheme found to be functional in replacement village
15	Purnia	Bairia	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Singhla. Scheme found to be functional in replacement village
16	Banka	Maniaun	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Barimuhani. Scheme found to be functional in replacement village
17	Banka	Jamua	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Singarpur. Scheme found to be functional in replacement village
18	Lakhisarai	Bataspur	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Tajpur Dogra. Scheme found to be functional in replacement village

Table No. 11: List of replaced villages				
S. No.	District Name	Village Name	Status Of The Scheme (No Scheme/Replaced & Defunct)	Remarks
19	Sheikhpura	Mahuet	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Bhalua. Scheme found to be functional in replacement village
20	Buxar	Baksara	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Rehiya. Scheme found to be functional in replacement village
21	Buxar	Jaipur	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Bankat. Scheme found to be functional in replacement village
22	Buxar	Turiganj	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Chatanwar. Scheme found to be functional in replacement village
23	Jamui	Mushahri Tanr	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Marwa. Scheme found to be functional in replacement village
24	Jamui	Tetaria	No Scheme	No Scheme present in the sampled village, hence replaced with Village- Vermania. Scheme found to be functional in replacement village