

Assessment of functionality status of household tap connections in rural areas (2020-21)

State report

Bihar



Submitted to:
National Jal Jeevan Mission
Department of Drinking Water and Sanitation
Ministry of Jal Shakti

Report prepared by:
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1. Introduction

Announced in 2019, the Jal Jeevan Mission – Har Ghar Jal (JJM – HGJ) is implemented by Department of Drinking Water and Sanitation (DDWS), Ministry of Jal Shakti in partnership with States/ UTs. JJM aims to provide a Functional Household Tap Connection (FHTC) to every rural home in the country by 2024. A household tap connection is said to be functional when the tap water supply is of adequate quantity (minimum 55 lpcd) and prescribed quality (as per BIS:10500) on regular and long-term basis. Further, JJM seeks to promote holistic management of local water sources and not just provide tap water connections.

The DDWS had engaged Nielsen (India) Private Limited to undertake 'Functionality Assessment' of household tap connections. The assessment covered household tap connections in 6,992 villages across 704 districts from 31 States/ UTs. The survey was undertaken in November – December 2020.

2. Objectives of the study

The main objectives were an assessment of Functionality of Household Tap Connections (FHTCs) under JJM on various parameters; ascertaining, in the form of data, on-ground progress of JJM in terms of adequate quantity of prescribed quality of drinking water supplied to rural households on regular basis; and engaging with Gram Panchayats and/ or its sub-committees of the sample villages and soliciting their feedbacks and recommendations for improving the programme implementation; and to suggest measures for mid-course correction for improvement in functionality of household tap connections.

3. Approach and Methodology

The approach followed was to assess the functionality of household tap connections (within premises) and in-village drinking water supply infrastructure. The selection of sample villages was from the JJM-Integrated Management Information System (IMIS) data-base of villages having at least 15 household tap connections. In each sample village, the largest PWS scheme was sampled. The survey was planned as in-person Computer Aided Personal Interview (CAPI) survey, and included an on-ground assessment of the functionality of sample PWS schemes and tap connections attached to the same. The survey included measurement of the quantity of water received at the household level through the tap connection, as well as water testing to check whether the quality of the drinking water is as per the BIS standards, using Field Test Kits (FTKs) and H₂S vials. The study also collected supply side information, including assessment of the quantity of water supplied by the scheme, operation and maintenance arrangements, availability and functionality of scheme level infrastructure and the aspects related to source and system sustainability.

A sample of 10 villages from every district in the State were selected following probability proportionate to size (PPS) systematic random sampling method ensuring due representation of SC/ SC majority villages as well as quality-affected villages. In each selected village, households for the survey were selected at head end, middle and tail end of the selected piped water supply network. In Bihar the survey was conducted in 5621 households from 380 villages in 38 districts.

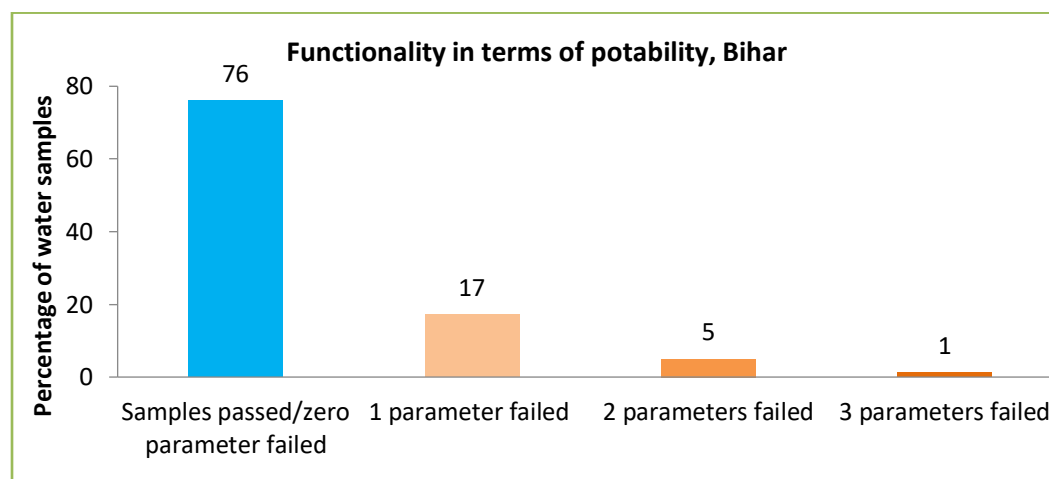
4. Key Findings

SL.	INDICATOR	Bihar	India
Household level			
1	Average household size	6.6	5.6
2	Percent of households using FHTC for drinking purpose	91.1	88.9
3	Percentage of households reported working tap connections (supply at least one day in last 7 days)	96.2	93.6
4	Number of water supply days in a usual week		
4a	1 – 2 days	3.5	7.6
4b	3 – 4 days	1.1	10.4
4c	5 – 6 days	0.8	1.5
4d	7 days	94.7	80.5
5	Number of water supply days in the last week		
5a	0 days	0.2	2.4
5b	1 – 2 days	4.6	9.7
5c	3 – 4 days	3.7	14.8
5d	5 – 6 days	3.0	4.9
5e	7 days	88.4	68.1
6	Percentage of households reporting reliability of water supply days	93.4	86.5
7	Percentage of households reporting tap connections functioning continuously for more than 15 days in a month for last 12 months	93.6	84.6
8	Average number of times water is supplied on the days of supply		
8a	1 time	3.9	56.6
8b	2 times	60.2	28.2
8c	3 times	35.7	6.1
8d	4 times/24 hours	0.3	9.1
9	Percentage of households reporting reliability of supply for different supply timings	93.1	84.3
10	Percentage of households reporting adequate water pressure for different supply timings		
10a	Morning	95.3	80.1
10b	Afternoon	97.1	84.6
10c	Evening	96.5	84.8
11	Percentage of households reported paying water tariff – separately or along with other taxes	7.1	52.8
12	Percentage of households reported receiving 55 lpcd or more	97.0	83.5
13	Percentage of households having potable water *	76.2	61.3
14	Percentage of households reporting regularity of supply	93.2	87.2
15	Percentage of households reporting functional tap connections	69.1	47.8
Village level			
16	Percentage villages having functional water and sanitation committees	43.9	48.5
17	Percentage of functional schemes in the sample villages considering all schemes (supplying water any day in the last 7 days)	95.0	86.0
18	Percentage of in-village schemes having O&M undertaken by village water	82.1	83.1

SL.	INDICATOR	Bihar	India
	and sanitation committee or by Panchayat		
19	Percentage of sample schemes reported having faced challenges in the last one year		
19a	Inadequate infrastructure	11.3	40.2
19b	Poor water availability at the source	6.2	33.0
19c	Poor maintenance	9.5	46.2
19d	Natural calamity	95.6	63.4
20	Percentage of schemes reporting measure to improve source sustainability	47.5	59.9
21	Number of sample villages found with no scheme (defunct/under construction/not handed over/not constructed)	4	751

Figures 1, 2 and 3 depicts the functionality aspects of the household tap connections in Bihar. Figure 1 presents the details of the potability aspects – the proportion of samples which have qualified as per all 13-15 parameters, as well as the proportion of sample which have failed due to one/two/three/more than three parameters.

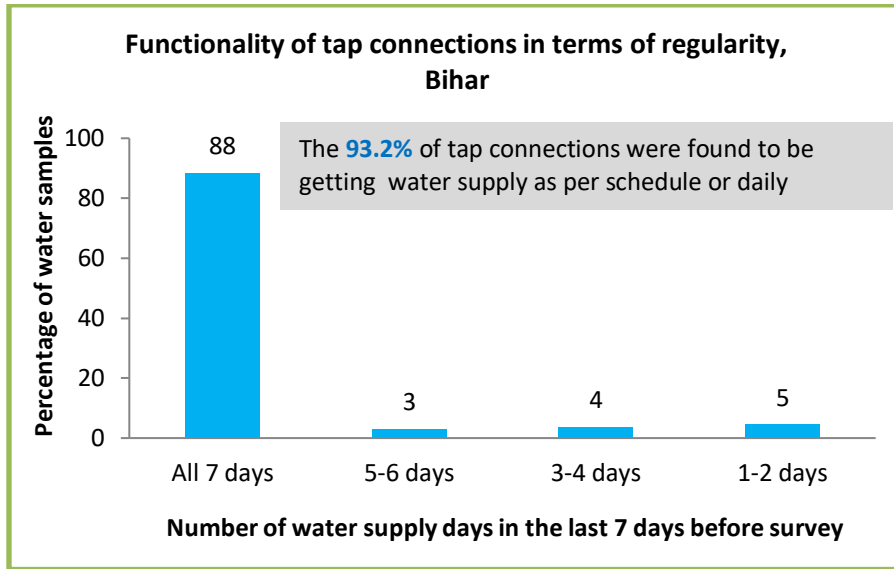
Fig 1: Functionality of the household tap connection in terms of potability - Bihar



Base: Households with water quality testing done, N: 382

Figure 2 presents functionality in terms of regularity, and presents the water supply situation in the last 7 days (before survey date). This includes information on the proportion of taps supplying water on all 7 days, 5-6 days, 3-4 days, 1-2 days and zero days in the last 7 days. As not all schemes are planned to supply water daily, the information of the proportion of taps supplying water daily or as per the water supply schedule is also presented.

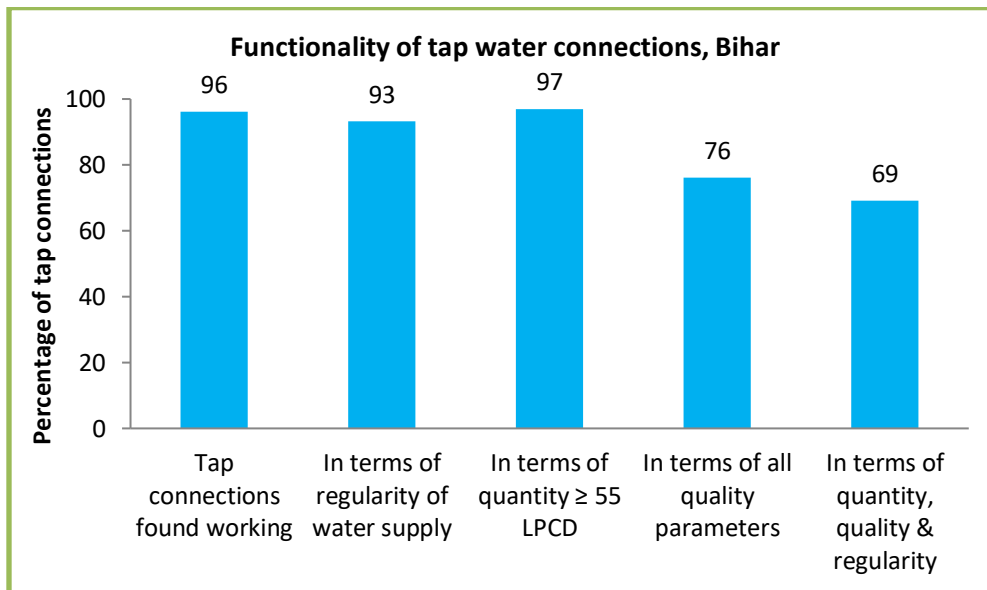
Fig 2: Functionality of the household tap connection in terms of regularity - Bihar



Base: All Households, N: 5619

Figure 3, presents the summary situation of the working tap connections (defined as supplying water atleast on one day in the last 7 days), the functionality in terms of the proportion of tap connections which have qualified regularity, quantity, quality parameters, and the proportion which have qualified all 3 parameters.

Fig 3: Overall functionality of the household tap connection - Bihar

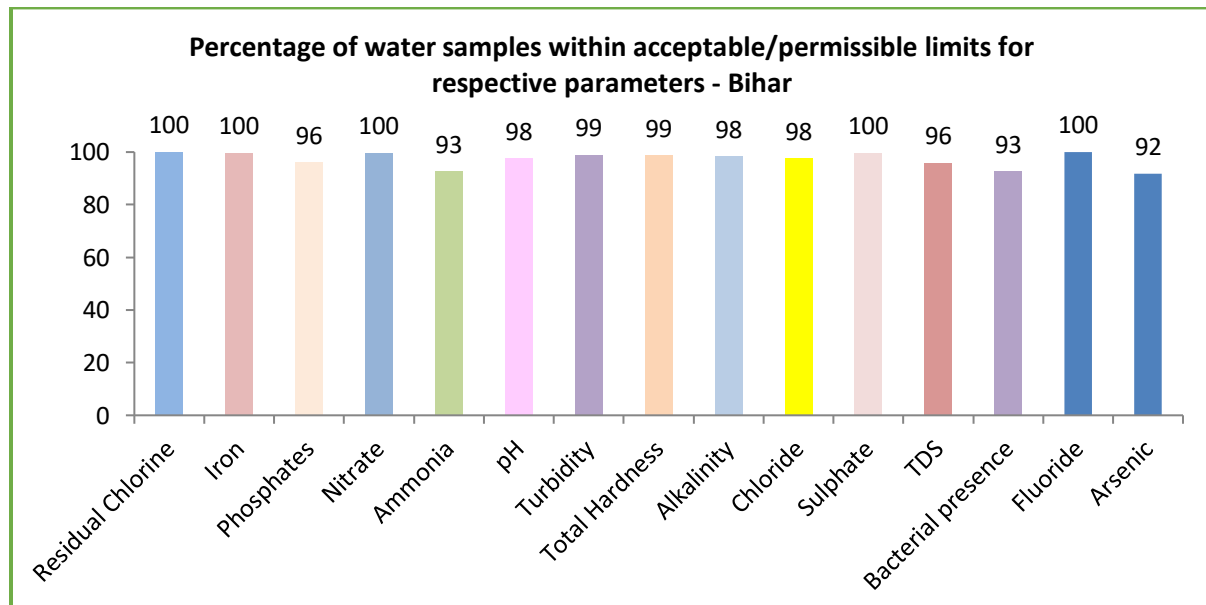


Base: Total count of tap connections considered for functionality assessment, N: 5442

A total of 382 water samples were tested as per BIS: 10,500 standards for all 15 parameters. Of these samples, 14 samples included testing for fluoride and 11 samples included testing for arsenic. All the water samples were taken from a randomly selected head end household of selected sample PWS schemes in the sample villages of Bihar – one sample for each of separate water sources in the village. The figure below shows the proportion of samples in which different parameters were found within acceptable/permissible limits.

As can be seen, almost all the samples (98% and above) had Residual Chlorine, Iron, Phosphates, Nitrate, pH, Turbidity, Total Hardness, Alkalinity, Chloride, Sulphate, and Fluoride within acceptable/permissible limits. However, eight percent of the samples tested for Arsenic were tested outside of the permissible limit.

Fig 4: Percentage of water samples within acceptable/permissible limits for respective parameters - Bihar



Pic 1: Household survey being undertaken in one of the villages in Bihar



Pic 2: Water quality sample testing being undertaken in a village in Bihar



5. Conclusions

Bihar has performed well in the functionality assessment with almost 2 out of every 3 households with tap connections have been assessed to have a functional tap connection. Almost all households have reported regular water supply and being supplied with 55 lpcd or more of water, and 76 percent having potable water supply, which is higher than the national figure. Bihar had higher proportion of functional tap connections (69%) as compared with the national average. About 97 percent of the households were estimated to be supplied 55 lpcd or more and 93 percent with a regular water supply. Since the tap connections considered to be functional were as per the JJM guidelines of including adequate quantity (55 lpcd or more), potability (as per BIS:10500 standards) and regularity of water supply (all days or as per the water supply schedule), the reason that a higher proportion of households had functional tap connections is mostly due to the higher proportion of households having a combination of quantity and regularity (73.5 percent households having adequate quantity and regularity of supply; 70.3 percent households having potable water received on a regular basis; while 91.6 percent households had adequate quantity of water supply on a regular basis).

The main issues with the samples which were not found potable were bacteriological presence (7%), as well as ammonia (7%) and Arsenic (8%) being above permissible limits.

For most of the schemes water supply was scheduled as daily supply but there seems to be variation from the schedule. A lower proportion of those reporting an usual daily water supply (94.7%), has reported receiving water supply on a daily basis in the last 7 days (88.4%). Almost two thirds of the households (60.2%) have reported being supplied water twice a day, and only a few households (3.9%) reported the supply to be once a day. 35.7% of the households reported 3 times water supply in a day. About 93 percent of the households have reported that water supply timings are reliable. The water

pressure is reported to be adequate for all the different water supplies in a day. About 92 percent households have mentioned that they had received water supply on a continuous basis for 15 days a month for the last 12 months.

However, despite good quality water supply service delivery, the fact only 7 percent of the households have reported paying water tariff is an area of concern. As per the JJM guidelines, the State Government needs to ensure 100% fund requirement for operation and maintenance of the schemes are met by the Agency responsible for water supply provision to function as a utility.

Almost two fifth of the villages (43.9%) have reported having water and sanitation committees – of these villages and wherever available, almost all (82.1%) have reported taking responsibility for operation and maintenance activities of the PWS schemes in about four fifth villages the water and sanitation committees were actually taking responsibility for operation and maintenance activities of the PWS schemes. As reported by the communities 'natural calamities' was the main challenges faced by the schemes. Slightly less than half of the schemes had taken any initiatives for source sustainability.

Annexures to this report includes:

- List of village with no scheme/defunct schemes/under construction is placed as Annexure 1,
- List of villages with schemes supplying only through tap stand/stand posts is placed as Annexure 2,
- List of villages where 15 FHTCs were not found is placed as Annexure 3,
- Indicative proportion of functional tap connections by districts is placed as Annexure 4, and
- List of villages where samples failed for given quality parameter is placed as Annexure 5

Annexure 1: List of village with no scheme/defunct schemes/under construction

S.No.	District Name	Block Name	Panchayat Name	Village Name	Name of Largest Scheme in the Village	Type	Status of the Scheme	Remarks
1.	Begusarai	Chorahi	Pardra	Dumri	MMNY Chaurahi Paraura Dumari 02	SVS	No scheme	No scheme in the village
2.	Bhojpur	Piro	Jitaura Janalgal Malahal	Hat Pokhar	PRD Scheme Data Not Available	0	No scheme	No scheme in the village
3.	Katihar	Barari	Durgapur	Durgapur	RWSS Durgapur Barari	MVS	No scheme	No scheme in the village
4.	Saharsa	Salkhua	Alani	Raingnina	MMGPNY (PWS) Sal I 141	SVS	Under construction	No PWS in the village. During the construction work, there has been some dispute and work has been stopped. Case is pending at court.

Annexure 2: List of villages with schemes supplying only through tap stand

S.No.	District name	Block name	Panchayat name	Village name	Name of largest scheme in the village	Type	Remarks
1.	Kishanganj	Kochadhamin	Mazkuri	Kushpara	Majkuri 1,2,3A,3B 4,5,6A,6B,7 8,9,10,11A,11B 12,13	MVS	No FHTC. Water supply through tap stand only

Annexure 3: List of villages where 15 FHTCs were not found

S.No.	District name	Block name	Panchayat name	Village name	Name of largest scheme in the village	Type
1.	Arwal	Karpi	Rampur Chai	Rampurchae	PRD Scheme Data Not Available	0
2.	Jehanabad	Ratni Faridpur	Jhunathi	Jhunathi	PRD Scheme Data Not Available	0
3.	Khagaria	Parbatta	Bundehra	Bundehra	Yadav Tola W9 Bandehra Parbatta Khagaria	SVS
4.	Madhepura	Shankarpur	Raibhir	Raibhir	MNI MDP 373	MVS

Annexure 4: Indicative proportion of functional tap connections by districts

S.No.	District	Percentage Functional Taps
1.	Araria	80.0
2.	Arwal	97.3
3.	Aurangabad	88.7
4.	Banka	56.3
5.	Begusarai	90.4
6.	Bhagalpur	88.0
7.	Bhojpur	46.7
8.	Buxar	47.3
9.	Darbhanga	79.9
10.	Gaya	89.3
11.	Gopalganj	58.7
12.	Jamui	93.1
13.	Jehanabad	87.9
14.	Kaimur (Bhabua)	26.0
15.	Katihar	37.0
16.	Khagaria	55.7
17.	Kishanganj	48.1
18.	Lakhisarai	80.7
19.	Madhepura	79.9
20.	Madhubani	59.3
21.	Munger	90.0
22.	Muzaffarpur	74.2
23.	Nalanda	74.5
24.	Nawada	64.0
25.	Pashchim Champaran	51.9
26.	Patna	52.2
27.	Purba Champaran	33.3
28.	Purnia	74.8

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S.No.	District	Percentage Functional Taps
29.	Rohtas	70.4
30.	Saharsa	63.0
31.	Samastipur	98.7
32.	Saran	40.0
33.	Sheikhpura	100.0
34.	Sheohar	46.7
35.	Sitamarhi	70.0
36.	Siwan	65.2
37.	Supaul	87.3
38.	Vaishali	60.0

Annexure 5: List of villages where samples failed for given quality parameter

S.No.	District name	Block name	Gram panchayat name	Village name
Villages with failed water samples for Turbidity test				
1.	Banka	Dhuraiya	Kathbangaon	Kath Bangaon
2.	Nawada	Sirdala	Bandhi	Bandhi
3.	Patna	Paliganj	Jarkha	Jarkha
4.	Saharsa	Sonbarsa	Parriya	Pararia
Villages with failed water samples for pH test				
1.	Banka	Barahat	Gurudhwar	Gordhwar
2.	Bhojpur	Arrah	Baghipakar	Singhi Tola
3.	Bhojpur	Garhani	Bagawa	Bagwa
4.	Gaya	Wazirganj	Bichha	Bichha
5.	Jehanabad	Makhdumpur	Kalanaur	Kurtha
6.	Kaimur (Bhabua)	Rampur	Amawan	Benipur
7.	Kishanganj	Terhagachh	Baigna	Gilni
8.	Purba Champaran	Ramgarhwa	Shiv Nagar	Shiv Nagar
9.	Purba Champaran	Sugauli	South Chhapra Bahas	Chhapra Bahas
Villages with failed water samples for Total Hardness test				
1.	Araria	Araria	Sahasmal	Sahasmal
2.	Khagaria	Khagaria	Marar North	Marar North
3.	Khagaria	Khagaria	Rahimpur Madhya	Durgapur
4.	Lakhisarai	Surajgarha	Arma	Arma
5.	Munger	Jamalpur	Indrukh(West)	Indrukh
Villages with failed water samples for Total Alkalinity test				
1.	Aurangabad	Aurangabad	Khaira Mirja	Badli
2.	Kaimur (Bhabua)	Noawan	Nuaon	Bhatwalia

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S.No.	District name	Block name	Gram panchayat name	Village name
3.	Khagaria	Parbatta	Saurh South	Bharat Khand
4.	Nalanda	Parbalpur	Shanker Dih	Sakardih
5.	Saran	Manjhi	Cheful	Imadpur
6.	Sheohar	Sheohar	Khairwa Darp	Shahpur
Villages with failed water samples for Chloride test				
1.	Bhojpur	Arrah	Baghipakar	Singhi Tola
2.	Bhojpur	Barhara	Matuk Pur	Ram Shahar
3.	Bhojpur	Jagdishpur	Hari Gaon	Dhaka Karam
4.	Bhojpur	Shahpur	Dumariya	Kharaun
5.	Buxar	Nawanagar	Bhadar	Bhadar
6.	Kaimur (Bhabua)	Bhabua	Sikathi	Akri
7.	Kaimur (Bhabua)	Rampur	Amawan	Benipur
8.	Kaimur (Bhabua)	Rampur	Kurari	Thiloin
9.	Rohtas	Dehri	Mathuri	Mathuri
Villages with failed water samples for Ammonia test				
1.	Banka	Amarpur	Kol Buzurg	Kol Khurd
2.	Banka	Katoria	Katoria	Katoria
3.	Gopalganj	Gopalganj	Yadopur Shukul	Nawada Chutur Bagaha
4.	Gopalganj	Sidhwalia	Kushahar	Kusahar
5.	Katihar	Amdabad	North Karimullapur	Balrampur
6.	Katihar	Korha	Simaria	Simaria
7.	Katihar	Mansahi	Chitauria	Chitauria
8.	Katihar	Pranpur	Pranpur	Sirauda
9.	Khagaria	Khagaria	Rahimpur Madhya	Durgapur
10.	Kishanganj	Bahadurganj	Bangama	Bangaon
11.	Kishanganj	Terhagachh	Baigna	Gilni
12.	Kishanganj	Terhagachh	Hawakol	Gamharia
13.	Muzaffarpur	Paroo	Jagdishpur Baya	Chhapra As
14.	Nalanda	Chandi	Sirnawa	Sirnawan
15.	Pashchim Champaran	Lauriya	Belwa Lakhanpur	Jiria
16.	Pashchim Champaran	Majhauia	Sarisawa	Bharwalia
17.	Pashchim Champaran	Ramnagar	Mahui	Semra
18.	Patna	Bikram	Haibaspur Gona	Habaspur
19.	Patna	Paliganj	Jarakha	Jarkha
20.	Purba Champaran	Adapur	Sirsiya Kala	Sirsia Kalan
21.	Purba Champaran	Kotwa	Machargama	Sabaiya
22.	Saran	Marhaura	Madhopur	Madhopur
23.	Saran	Nagra	Jagadishpur	Tetarpur

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S.No.	District name	Block name	Gram panchayat name	Village name
24.	Saran	Revelganj	Sitab Diyara	Shitab Diara
25.	Saran	Revelganj	Tekniwas	Teknawas
26.	Vaishali	Bidupur	Rahimapur	Rahimapur
27.	Vaishali	Jandaha	Adalpur	Khizirpur Jasparha
28.	Vaishali	Jandaha	Vishunpur Bedauliya	Chak Larhe
Villages with failed water samples for Phosphate test				
1.	Gopalganj	Barauli	Sadawa	Sadaua
2.	Gopalganj	Bhore	Raqba	Raqba
3.	Gopalganj	Sidhwalia	Kushahar	Kusahar
4.	Kaimur (Bhabua)	Mohania	Akorhi	Akorhi
5.	Kaimur (Bhabua)	Mohania	Dadar	Dadar
6.	Katihar	Mansahi	Chitauria	Chitauria
7.	Katihar	Pranpur	Pranpur	Sirauda
8.	Kishanganj	Bahadurganj	Bangama	Bangaon
9.	Pashchim Champaran	Chanpatia	Jaitia	Jaitiya
10.	Purba Champaran	Ghorasahan	Barwa Kalan	Bakuliya
11.	Sitamarhi	Suppi	Harpur Pipara	Marpa Issar Das
12.	Siwan	Bhagwanpur Hat	Balaha	Dehri
13.	Siwan	Darauli	Darauli	Darauli
14.	Siwan	Goriakothi	Baroha Prosatam	Barhoga Parsotim
15.	Vaishali	Mahnar	Gorigawan	Jagarnathpur
Villages with failed water samples for Iron test				
1.	Purba Champaran	Adapur	Sirsiya Kala	Sirsia Kalan
Villages with failed water samples for Nitrate test				
1.	Patna	Bikram	Haibaspur Gona	Habaspur
Villages with failed water samples for Sulphate test				
1.	Gopalganj	Bhore	Raqba	Raqba
Villages with failed water samples for Total Dissolved Solids test				
1.	Bhojpur	Arrah	Baghipakar	Singhi Tola
2.	Bhojpur	Barhara	Matuk Pur	Ram Shahr
3.	Bhojpur	Barhara	Matuk Pur	Ram Shahr
4.	Bhojpur	Jagdishpur	Hari Gaon	Dhaka Karam
5.	Bhojpur	Shahpur	Dumariya	Kharaun
6.	Buxar	Itarhi	Barka Gaon	Parsia
7.	Buxar	Itarhi	Narayan Pur	Bagahipatti
8.	Buxar	Nawanagar	Bhadar	Bhadar
9.	Buxar	Rajpur	Mangraon	Sagrawan

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S.No.	District name	Block name	Gram panchayat name	Village name
10.	Kaimur (Bhabua)	Bhabua	Sikathi	Akri
11.	Kaimur (Bhabua)	Bhabua	Dihara	Bare
12.	Kaimur (Bhabua)	Rampur	Amawan	Benipur
13.	Kaimur (Bhabua)	Rampur	Kurari	Thiloin
14.	Munger	Jamalpur	Indruk(West)	Indruk
15.	Rohtas	Dehri	Mathuri	Mathuri
16.	Rohtas	Sasaram	Mahdi Ganj	Katdehri
Villages with failed water samples for Bacteriological present/ absence test using H2S vials				
1.	Bhagalpur	Kharik	Dhurubgang	Kharik
2.	Bhojpur	Barhara	Matuk Pur	Ram Shahr
3.	Bhojpur	Barhara	Matuk Pur	Ram Shahr
4.	Bhojpur	Jagdishpur	Hari Gaon	Dhaka Karam
5.	Bhojpur	Shahpur	Dumariya	Kharaun
6.	Buxar	Chausa	Banarpur	Banarpur
7.	Buxar	Itarhi	Barka Gaon	Parsia
8.	Buxar	Nawanagar	Bhadar	Bhadar
9.	Buxar	Rajpur	Mangraon	Sagrawan
10.	Darbhanga	Ghanshyampur	Kortho East	Kortho East
11.	Kaimur (Bhabua)	Rampur	Amawan	Benipur
12.	Khagaria	Alauli	Shahar bani	Sahar bani
13.	Madhubani	Ghoghardiha	Suday Ratauli	Sudai Ratauli
14.	Madhubani	Ladania	Gidhwas	Gidhwas
15.	Madhubani	Laukaha	Khutauna	Ekhatha
16.	Madhubani	Madhepur	Karahara	Tingri
17.	Nawada	Akbarpur	Panti	Sadipur
18.	Nawada	Rajauli	Rajauli West	Sonu Taar
19.	Nawada	Sirdala	Bandhi	Bandhi
20.	Pashchim Champaran	Ramnagar	Mahui	Semra
21.	Patna	Dhanarua	Gobindpur Baurihi	Baurihi
22.	Patna	Mokama	Mekra	Mekra
23.	Purba Champaran	Kalyanpur	Brindavan	Birdaban
24.	Sheohar	Piprarhi	Amwa Kala (N)	Amwa Kalan
25.	Sheohar	Purnahiya	Barahi Jagdishpur	Chanfaheha Durvajpur
26.	Sheohar	Sheohar	Mirzapur Dhobahi	Rampur Jadu
27.	Sitamarhi	Bairgania	Pachataki Jadu	Nandwara
28.	Sitamarhi	Dumra	Mishraulia	Mishraulia
Villages with failed water samples for Arsenic test				

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S.No.	District name	Block name	Gram panchayat name	Village name
1.	Begusarai	Naokothi	Samsa	Samsa