



**SaciWATERS**

Internship Report on: -  
**Role of Civil Society Organization (Samta) over Water Quality  
Issues Focusing on Arsenic**

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## 1. Introduction: -

Khagaria is a district of Bihar. Earlier it was the part of the Munger district. Its sub-division was created in the year 1943-44. It was upgraded as a district, with effect from 10<sup>th</sup> May, 1981, vide Government of Bihar Notification no. – 7/T-1-207/79 dated 30<sup>th</sup> April, 1981.

This region is a region of rivers. There is seven rivers flow through this region and due to the regions of plains this region is flooded every year. Khagaria is located at 25.5°N and 86.48°E and has an average elevation of 36 metres.

This report mainly focused on the arsenic affected regions of Khagaria district of Bihar and the work done by Samta for the awareness of people of this district against arsenic contaminated water. It is also show the historical background of Khagaria district and its major occupation and the changes came in the agriculture after last few years. It also shows the establishment of NGO Samta and its historical background and the interventions done by it in the villages of Khagaria over water quality issues. This report also contains the list of villages of this district that is affected by arsenic with the help of the list of PHD, Khagaria. It also shows the diseases caused by arsenic contaminated water in the villages and its effect on the villages and households. This report also contains the water testing report of 2015 conducted by Samta in different households.

This region is affected by arsenic and there are many cases that people are dying due to drinking arsenic contaminated water. This area has seen sudden spread of cancer and there is a general understanding that the arsenic contaminated water is a cause of disease. In the early 2007 this region has seen the emergence of radical movement for pure and clean drinking water. Samta and Megh Pyne Abhiyan took over the lead and it start movement to create about arsenic for this crisis.

## 2. Methodology: -

In my study, I have used these methods of data collection: -

1. Personal interview.
  2. Questionnaire,
  3. Focussed Group Discussions (FDG), and
  4. Sampling.
- 
1. Personal Interview – I have conducted personal interview of executives of Samta and they gave me more information for my study. I also applied this method in the villages for collecting information from the village head.
  2. Questionnaire – I have used questionnaire method to the villagers where I had visit. I had asked open and close ended questions to them.
  3. FGD – I had used FGD method in the villages, where people of similar background had come together and discussed.
  4. Sampling – I had used convenience sampling method. I had taken the sample according to my convenience. I had chosen those villages as a sample where, Samta had done more of their works.

### 3. About study area Khagaria district

Khagaria district is situated in the middle of North Bihar. This district is situated on the course of many rivers. There are lot of rivers in this district. Here we can see all rivers that flow in the North Bihar except Mahananda, these rivers are as follows – Ganga, Budhi Gandak, Kosi, Baghmati, Kamla Balan. This district is a concourse place of many small and big rivers of North Bihar.

Khagaria district is also known as Farakiya, it is more famous as Farakiya. There is an interesting story behind this name. In the time of Emperor Akbar, his finance minister Todarmal was conducting a survey of whole area after much effort the area could not be surveyed. Survey could not be completed due to the vast network of rivers and its subdivisions. After getting information, Emperor Akbar circled the area and wrote it in Arabic language ‘Farak Kiya’, which after distortion became ‘Farakiya’. This district is venue of Budhi Gandak and Ganga.

Table 3.1: Demographic Profile of Khagaria District

#### I. Population

1	Rural	15,79,727
2	Urban	87,159
3	Total	16,66,886
4	Males	8,83,786
5	Females	7,83,100
6	SCs	59,032
7	STs	170
8	Population Growth Rate	30.19%

(Source: Census 2011)

#### II. Vital Statistics

1	Crude Birth Rate	30.4%
2	Crude Death Rate	9.3%
3	Sex Ratio (Females per 1000 males)	926

(Source: Census 2011)

### III. Literacy

1	Male Literacy Rate	65.25%
2	Female Literacy Rate	49.56%
3	Total	59.72%

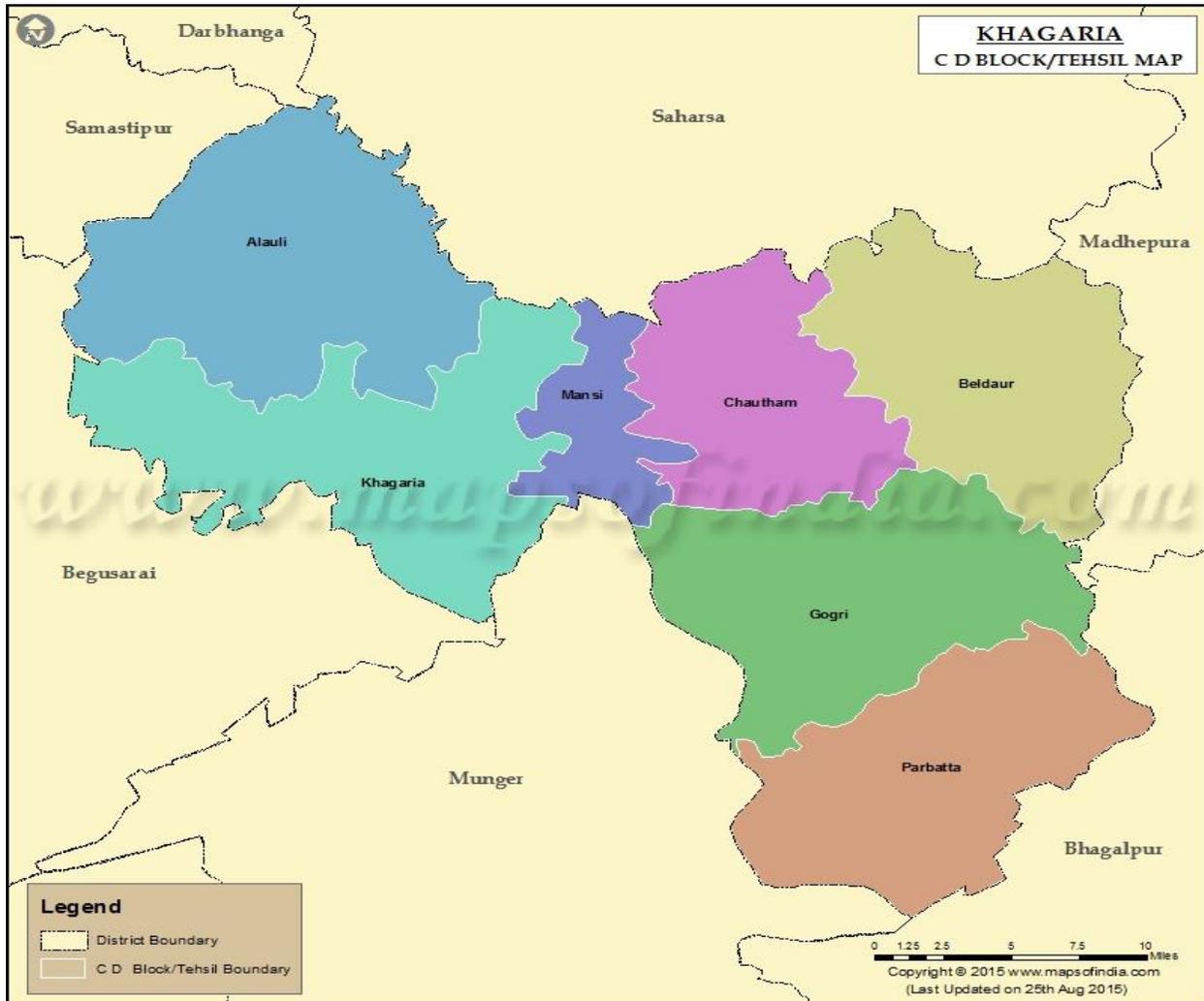
(Source: Census 2011)

### IV. Revenue Village

1	Total	306
2	Inhabited	249
3	Uninhabited	57
4	Panchayat	129
5	Sub-division	01
6	Block	07
8	Revenue Circle	07
9	Towns	02
10	Nagar Parishad	02
11	Nagar Panchayat	01
12	M.P. Constituency	01
13	M.L.A. Constituency	04

(Source: DHAP Khagaria 2012-13)

Map of Khagaria district



(Source: [www.mapofindia.com](http://www.mapofindia.com))

### 3.1. Agriculture: -

Agriculture is the main occupation of this district. This district was once very famous for the agriculture of gram. Rabi's cultivation was very much in this area, but due to the change in the current crop cycle, both the Rabi and Kharif crops of this region have had very bad effect. Now there is hardly any gram can be seen in a field. Wheat can be cultivated today but farmers of this region merely cultivated gram, chilies, pulses and oilseeds.

The main reasons for the change in the crop cycle in this area were due to the construction of the dam and constructed dams. Rabi's cultivation was very good in Chautham division of Khagaria. In that time, public representative and people in the planning commission were talk about to build Bara Nagar dam. When the local people came to know it, they were quite opposed. Then the immediate engineers and the public representatives began to try to understand that if this embankment becomes possible then the cultivation of Rabi will be accompanied by Kharif as well. The people supported them so much and they worked hard by day and night to complete this dam. They took 10 years to complete this 32-kilometer-long dam. They helped to build this embankment by thinking that their luck will be open and they will also cultivate Kharif with Ravi. When this embankment was ready, then Kharif was not cultivated and Ravi's farming was ended too. Then started the migration.

On one hand, people were going out of the village for their livelihood; on the other side, Kosi Bagmati was being absorbed in the villages of the village due to the erosion of rivers.

Once fruitfulness village now become unfruitfulness. The people sitting in the rehabilitation camp are still displaced while by migration and a number of people is fleeing from the villages.

As a result, poor are becoming poorer, the major occupation of this region is agriculture, animal husbandry, fish farming are completely dead. Now the farmers of this areas are cultivated corn which these people do not eat by themselves, they export it.

If we talk about fish, before 15-20 years this district exported fish all over the country whole year but today it imports fish from Andhra Pradesh.

The people who have lost their land in flood are landless and they are not benefitted by any government scheme such BPL card, Indira Awas Yojna and any other government schemes because on the government record they have land that does not indicate that they are poor but in reality, these lands has washed away by flood or drowned in the rivers.

### 3.2. Arsenic affected Regions of Khagaria district: -

The 123 tolas of 51 villages of 49 panchayats of 4 blocks of Khagaria district is affected by arsenic contaminated water. In other words, we can say that the whole district is affected by arsenic.

The arsenic affected areas of the district, we have come across two hotspots, in the district namely Madarpur and Purvi Thatha panchayats, where a substantial population is affected by skin disease and cancer. While interacting with people in the region, we realized that there is an inherent fear of arsenic being the main cause for the problem.

List of arsenic effected region of Khagaria district: -

S. No.	Block	Panchayat	Village	Habitation/Tola
01	Khagaria	Rahimpur North	Rahimpur North	Sahani Tola
02		Rahimpur North	Rahimpur North	Pachkhutti
03		Rahimpur North	Rahimpur North	Mahaut Tola
04		Rahimpur North	Rahimpur North	Charkhutti
05		Rahimpur North	Rahimpur North	Kumharchakki
06		Rahimpur North	Rahimpur North	Sonbarsa
07		Rahimpur North	Rahimpur North	Kurmi Tola
08		Rahimpur North	Rahimpur North	Naya Tola
09		Rahimpur Middle	Rahimpur Middle	Morkahi
10		Rahimpur Middle	Rahimpur Middle	Nanhaku Mandal
11		Rahimpur Middle	Rahimpur Middle	Kallar Tola
12		Rahimpur Middle	Rahimpur Middle	Tartar
13		Rahimpur Middle	Rahimpur Middle	Amba
14		Rahimpur Middle	Rahimpur Middle	Durgapur
15		Rahimpur Middle	Rahimpur Middle	Harijan Tola
16		Rahimpur South	Rahimpur South	Jangli Tola
17		Rahimpur South	Rahimpur South	Mathar
18		Rahimpur South	Rahimpur South	Barkhandi Tola
19		Rahimpur South	Rahimpur South	English Tola
20	Mansi	Khutia	Khutia	Matihani
21		Khutia	Khutia	Ekania
22		Khutia	Khutia	Gharari Tola

23	Mansi	Khutia	Khutia	Araeya	
24		Khutia	Khutia	Harijan Tola	
25		Khutia	Khutia	Jagriti Tola	
26		Khutia	Khutia	Rajput Tola	
27		Khutia	Khutia	Kamathan	
28		Balaha	Balaha	Dera Masehari	
29		Amni	Amni	Amni	
30		Chakhussaini	Chakhussaini	Kahar Tola	
31		Chakhussaini	Chakhussaini	Tanti Tola	
32		Chakhussaini	Chakhussaini	Kurmi Tola	
33		West Thatha	West Thatha	Rajajan	
34		Gogri	Jhikitia	Jhikitia	Patla
35			Jhikitia	Jhikitia	Chhoti Jhikita
36	Jhikitia		Jhikitia	Kazichak	
37	Jhikitia		Ramchandrapur	Ramchandrapur	
38	Maheshkhuth		Maheshkhuth	Bichli	
39	Maheshkhuth		Maheshkhuth	Purbi	
40	Maheshkhuth		Maheshkhuth	English	
41	Maheshkhuth		Maheshkhuth	Maheshkhuth	
42	Madarpur		Madarpur	Bari Madarpur	
43	Madarpur		Madarpur	Chhoti Madarpur	
44	Madarpur		Madarpur	Jahn Mohammad	
45	Madarpur		Madarpur	Govindpur	
46	Madarpur		Madarpur	Tour	
47	Madarpur		Madarpur	Harijan Tola	
48	Borna		Borna	Borna	
49	Paikant		Paikant	Birbas	
50	Pakrail		Pakrail	Harijan Tola	
51	Baltara		Baltara	Kanhaul	
52	Pasraha		Pasraha	Sondiha	

53	Gogri	Banni	Banni	Chaidha	
54		Banni	Banni	English Tola	
55		Jamalpur North	Jamalpur North	Garmohani	
56		Jamalpur North	Jamalpur North	Laxmipur	
57		Jamalpur South	Jamalpur South	Goria Bathan	
58		Paura	Paura	Paura	
59		Ratan	Ratan	Ratan	
60		Sher Chakala	Sher Chakala	Gahmauti	
61		Rampur	Rampur	Rampur	
62		Gauchhari	Gauchhari	Harijan Tola	
63		Gauchhari	Gauchhari	Mansi Tola	
64		Muskipur	Muskipur	Naya Tola	
65		Muskipur	Muskipur	Yadav Tola	
67		Basudevpur	Basudevpur	Harijan Tola	
68		Basudevpur	Basudevpur	Baraitha	
69		Basudevpur	Basudevpur	Bhurraiya Tola	
70		Koyla	Koyla	Basua	
71		Maira	Maira	Laxminia	
72		Maira	Maira	Sisbanni	
73		Devtha	Devtha	Kharna	
74		Itahari	Itahari	Itahari	
75		Itahari	Itahari	Bhuria Tola	
76		Itahari	Itahari	Fudkichak	
77		Itahari	Itahari	Katghara	
78		Gogri	Gogri	Imadpur	
79		Gogri	Gogri	Kundi	
80		Parbatta	Siyadatpur Agauni	Siyadatpur Agauni	Babraha
81			Siyadatpur Agauni	Siyadatpur Agauni	Pachimi Tola
82			Siyadatpur Agauni	Siyadatpur Agauni	Dumri
83	Siyadatpur Agauni		Siyadatpur Agauni	Raka	

84	Parbatta	Temtha Karari	Temtha Karari	Temtha
85		Temtha Karari	Temtha Karari	Sirajpur
86		Temtha Karari	Temtha Karari	Tanti Tola
87		Temtha Karari	Temtha Karari	Muslim Tola
88		Temtha Karari	Temtha Karari	Araga Tola
89		Khiradih	Khiradih	Baitha
90		Khiradih	Khiradih	Das Tola
91		Khiradih	Khiradih	Purbi Tola
91		Khiradih	Khiradih	Mandal Tola
93		Khiradih	Khiradih	Paschim Tola
94		Khiradih	Khiradih	Thithi Tola
95		Parbatta	Parbatta	Rupauli
96		Parbatta	Parbatta	Kanhaiyachak
97		Rampur A.K.A. Rahimpur	Rampur A.K.A. Rahimpur	Jankichak
98		Rampur A.K.A. Rahimpur	Rampur A.K.A. Rahimpur	Harijan Tola
99		Rampur A.K.A. Rahimpur	Rampur A.K.A. Rahimpur	Tanti Tola
100		Rampur A.K.A. Rahimpur	Rampur A.K.A. Rahimpur	Rampur
101		Madhavpur	Madhavpur	West Tola
102		Madhavpur	Madhavpur	Chamar Tola
103		Madhavpur	Madhavpur	Sharma Tola
104		Madhavpur	Madhavpur	Rajput Tola
105		Madhavpur	Madhavpur	Mistri Tola
106		Pipralatif	Pipralatif	Pipralatif
107		Pipralatif	Pipralatif	Marraia
108		Pipralatif	Pipralatif	Islampur
109		Sourh South	Sourh South	Bharatkhand

110	Parbatta	Zorabarpur	Zorabarpur	Bhagwati Tola
111		Zorabarpur	Zorabarpur	Kazzalban
112		Zorabarpur	Zorabarpur	Sri Mani Tola
113		Dariyapur Bhelwa	Bhelwa	Pachkhutti
114		Khajraitha	Khajraitha	Yadav Tola
115		Bandhera	Bandhera	Bandhera
116		Kulharia	Kulharia	Kulharia
117		Kabela	Kabela	Kharagpura
118		Lagar	Lagar	Harijan Tola
119		Lagar	Lagar	Udaypur
120		Mahaddipur	Mahaddipur	Harijan Tola
121		Sourh North	Sourh North	Belhar
122		Bharso	Bharso	Bharso
123		Bharso	Bharso	Salarpur

(Source: PHD Khagaria, Accessed – June 2017)

## Representation of 4 blocks of Khagaria district on the map: -



(Source: Google Map)

Above map showing the arsenic affected regions of Khagaria district as sequence no. 1 is Khagaria block, no. 2 is Mansi block, no. 3 is Gogri and no. 4 is Parbatta. As it can be seen that the all four blocks are nearby the bank of rivers and it is situated under 5 Km from the bank of rivers and according to PHD Khagaria, the areas situated near bank of rivers are highly arsenic affected.

### 4. Arsenic an Overview: -

Arsenic is a poisonous element, it is a metalloid. It found in Earth's crust in the form of minerals. It is soluble in water. Where it is inside the ground at that place, it comes up with the water by handpumps. The arsenic contaminated water is like clean water. It cannot be differentiated with the naked eye.

Arsenic mainly occurred in nature in two forms: -

1. Organic Arsenic, and
2. Inorganic Arsenic

1. Organic Arsenic mainly found in the sea and seafoods.
2. Inorganic Arsenic is generally more toxic and highest in underground water in areas and in soil natural contamination sources.

Arsenic contaminated water – The standard of arsenic contamination is different by country region. According to WHO standard water having arsenic above 10µg/L is considered as arsenic contaminated and in India according to Bureau of Indian Standard (BIS) water having arsenic above 50µg/L is considered as arsenic contaminated.

Arsenic contamination in the soil depends upon geological condition as well as anthropogenic activities. Soil having arsenic 10,000mg/Kg or above is considered as arsenic contaminated.

Disease occurred from arsenic is known as ‘Arsenicosis’ and ‘Arsenicism’.

Arsenicosis is a chronic illness resulting from drinking water with high level of arsenic over long period of time. It is commonly known as arsenic poisoning.

Arsenicism refers to a disease condition caused by slow poisoning with arsenic.

Arsenic is also known as sweet poison or slow killer because its presence in the water cannot be traced by the naked eye it is only traceable by few tests done in the lab.

#### 4.1. Arsenic in water and its understanding to Samta: -

Water having arsenic contamination cannot be differentiate with the naked eye because its presence neither change colour of water nor produce any smell. It appears clean drinking water.

Samta sees arsenic as a poisonous element that present in water and it cannot be traced by naked eye, because arsenic can also be dissolved in clean water that appears safe for drinking, but by drinking arsenic contaminated water cause different kinds of diseases like – patches on skin, black and white spots on the skin and over a long period of time it causes cancer.

According to Samta in Khagaria there are many different ways to contamination of arseic in water. One of them is its geological location and river. There are seven rivers that flow to this region and every year they bring flood to this region. Khagaria is a region of plains during the flood time the rivers of this region overlap to each other and flooded the entire region and due to flood water

arsenic, that is present in the earth crust dissolved in flooded water and when this water soaked by the earth and then it meets with underground water then it contaminates the underground water.

Another reason of its contamination in the drinking water is the rivers that originated from the Himalayas. According to this reason the rivers that originated from the Himalayas flow through many hilly and plateau land and washed them and due to this it gets in contact with arsenic that is present in that rocks and soil. And when this water recharges the underground water it contaminates the underground water.

#### 4.2. Effects of Arsenic on Human body: -

By drinking long term arsenic contaminated water can cause cancer in the lungs, bladder and kidney. It can also cause skin diseases such as thickening and pigmentation on the skin or in other words white or black spot emerged on the body, which slowly get tight and rough. These effects can be seen in the areas where drinking water is heavily contaminated with arsenic. When the amount of arsenic is high there were diseases of the stomach and skin occurred. If there is delay in treatment or treatment could not be done at the right time, the disease spreads to the different parts of the body and leads to cancer.

Non-carcinogenic effects of chronic arsenic exposure: -

1. Neurobehavioral and Neuropathic effects,
2. Effects on memory and intellectual function,
3. Reproductive health,
4. Steatosis (Fatty Liver),
5. Cardiovascular disease,
6. Ischemic heart disease,
7. Carotid atherosclerosis,
8. Respiratory system disease,
9. Effect on hormonal system,

#### 4.3. Arsenic in Foods: -

The contamination of arsenic is also found in cereals, fruits and vegetables by the irrigation of the fields with the arsenic contaminated water and its presence in the soil and absorbed by plants. Its contamination also found in the milk and meat, because it accumulated in the animal's body through drinking water and their food such as grass, food grain and vegetables' residue and etc.

#### 5. About Samta: -

Samta is an NGO, which was registered on November 4, 1993. It is mainly based on the Jay Prakash Narayana's principle of 'Total Revolution.' Samta mainly works on flood and pure drinking water.

There is a different story of the establishment of Samta, its secretary Mr. Prem Kumar Verma, actively participated in the Jay Prakash Narayan's movement in 1974. Considering the ideology of the 'Total Revolution', he kept himself away from politics and attached himself to social work. He joined the organization 'Samta Yuvajan Sabha' and worked for the development of society.

During its work, Samta has been working on the problems created by flood and the effects of that problems such as - effects on the agriculture, migration, displacement and erosion of the lands in this region. Samta has been specially working on the problems of Dalit - Mahadalit and women.

In 1984, the catastrophe came after the breakdown of the embankment on the Koshi in Navhatta block of Saharsa district of Bihar, then he attempted to understand the problems came out of floods in collaboration with 'Samta Gram Sabha', an organization created by the followers of Jai Prakash Narayan's movement and stated social work by living among the people who is affected by the flood. In 1987, he again rejoins 'Samta Gram Sabha' when again this area affected by flood.

Samta was established in 1993 by the breaking of the organization 'Samta Gram Sabha' in 1991. From that time onwards, he is working with the society. Samta started the work with the understanding the various forms of water in 2005; Since 2005, it has been understanding the water sources like river, dug-wells, pond, rain water and ground water. After trying to understand all of these, it worked on the problem of providing pure drinking water to the flood prone areas.

Throughout the floods of 2007, they encouraged the people to drink pure water and through the cheap and equitable technique by collecting rainwater and its alternate management. Slowly this

work started the participatory program for 4 flood affected panchayats, 3 arsenic affected blocks, to provide pure drinking water to everyone. In Chautham Tola of Thatha Panchayat of Mansi Block this Tola is situated beside Ganga and Budhi Gandak, it is working on the arsenic since 2013.

Samta is currently working on: -

1. Water level measurement of Khagaria district: - Samta had conducted the measurement of underground water level and its direction of flow with the help of a device they call hydro-marker.
2. Testing the water quality of rainwater and underground water: - Samta had taken the samples of underground water of different household and conducted its test. It also took the samples of rainwater for the testing. (See Water Testing report, 2015, pg. 27)
3. Arsenic affected regions of Khagaria district: - Samta had pointed the region of Khagaria district which is affected by arsenic and it is also looking for the new places which is recently affected by arsenic by conducting water testing in a certain interval.
4. Providing treatment facility for those people who is suffering with the cancer with the help of Mahavir Cancer Sansthan: - Samta had called the doctors of Mahavir Cancer Sansthan for the treatment of patient suffering with cancer. It was just for the check-up of the villager that how many villagers are suffering with cancer and the result was astonishing, there is at least one person from every family of villages which is suffering with cancer and there is a family which 4 members are suffering with cancer. They cannot provide medicine to the patient. For the medicine, the patient has to go to Mahavir Cancer Sansthan, Patna.
5. Looking for the settlement of those people who lost their homes in the flood: - Samta is trying to get the villagers a proper settlement with the help of government by providing them a habitation camp.

Agendas of working of Samta: -

1. Pure and clean drinking water for all: - It is the main agenda of Samta. It wants that every people of the village should get pure and clean drinking water and for that they have marked the handpumps which is affected by arsenic, so that the villager cannot get water from these handpumps.

2. There should be a better policy for water management in this region (Khagaria district): -  
Samta wants there should be a better policy for water management in this region that I every villager should get access to the water sources which is not affected by arsenic not just the person who owns it.
3. Government scheme should reach to every people of the society or to the grassroots level of the society: - Samta wants that the scheme that is made for the better livelihood of poor should reach to every people of the village and every people of villages should know about the scheme made by government for their welfare.

5.1. Interventions done by Samta to aware the people with respect to water: -

- To provide information to the Bhujal-Dut (groundwater messenger) about water resources and water sources: - Bhujal-Dut are those persons who are taking their drinking water by collecting rainwater. Samta had made them aware about rainwater and told them about its purity so that they can use it for drinking, cooking, bathing and other works.
- The making of Bhujal-Dut is depending upon trust of the people who are working in Samta, hence they are collecting and drinking rainwater.
- Second explanation about the Bhujal-Dut, that is it can be need and necessity for drinking water in the interview I was told by the leaders of Samta that Bhujal-Dut was started when Khagaria was flooded and there was crisis of water for drinking.
- Initially the professors from A.N. College Patna, visited Khagaria and made a survey on underground water and aquifer. They tested the water and found contamination of arsenic in it.

Brij Bhushan Jha an associate of Samta explained that how they convinced people for the drinking of rainwater. In 2007 when Khagaria is flooded and people were living in camps and there was crisis of food and drinking water. Then they convinced the people to drink water by collecting it. Their technic of collecting rainwater is very simple, when it rain collect the water with the help of plastics sheets. When it rains the second time then they collect water in it and then they store water in a container for the drinking. In the early time many people were hesitated to drink this water so for convincing of these

people they started to drink it by themselves and crisis of water could be another reason for the drinking of rainwater.

After drinking the rainwater many people appreciated their technic and convinced other to drink it and also suggest that it keeps them healthy and it tastes is better than under-groundwater and it keeps away the gastric problem. Soon after many people started to drink rainwater by collecting it. The people who collected rainwater for the drinking and convinced other to drink it Samta called them 'Bhujal-Dut'.

- Understanding of underground water and aquifer: - By understanding mean to find out the new aquifer which not affected by arsenic and how depth underground water is affected by arsenic. At present time, the all known aquifer is affected with arsenic.
- To grasp the information about the geological condition on the basis of local knowledge: - Samta wants to understand that is it geology of Khagaria that help arsenic to contaminate with water with the help of local knowledge, by knowing that, had this phenomenon happened in the past time?
- Practice and mapping of underground water: - Samta had mapped the underground water of this region and find out that all the aquifer of this region is affected by arsenic.
- To analyse the quality of water on the basis of graphs and data: - Samta has analysed the quality of water and showed it with the help of the graphs.
- To analyse the water level data on the basis of weather records: - There is different level of water in different weather. Samta analysed it and try to find out that in which season the water is mostly affected by arsenic and the result is not predictable. Sometimes it is the rainy day that gives more arsenic in the water and sometimes it is summer and sometimes it is winter.
- To get information about the slope of the land and the situation and flow of the water of aquifer on the basis of data collected by the hydro-marker.
- How water and sanitation is related: - Samta aware the villager that how water and sanitation is related and how water is used for the sanitation and how water logging causes many diseases.
- What is eco-san toilet and its importance: - Samta aware villager to use eco-san toilet and conserve water, because in eco-san toilet there is no use of water.

- Management of wastage water: - Management of wastage water means the management of rainwater from the wasting by collecting them. To show the villager the methods to collect the rainwater.

## 5.2. Social Impact of Interventions: -

Due to these interventions villagers getting to understand the drinking water. They are getting to test water by guava leaves and using mutka-filter. Mutka filter is being used in each household. They began to understand the diseases arose from the water and try to get proper treatment. The awareness of arsenic and diseases have led the villages to have daily check-up. They visit Mahavir Research. Mahavir Cancer organises frequent medical camps in the villages. People from Mahavir cancer are engaged in collecting sample, diagnosing cancer cases and giving treatment at their institute. They are collecting rainwater for drinking and for other purpose.

## 5.3. Perceptions of people regarding Arsenic

### (i) People's perception about flood and arsenic relation:

People of this district think that the flood is the one of the major reason for the contamination of arsenic in the underground water. There are seven rivers flow through this region and they bring flood every year to this region. During the flood the rivers easily get in contacted with the arsenic that is present in the grounds and hills and it easily dissolved in the rivers water and due to the rising level of under-groundwater river's water easily recharge under-groundwater and contaminated it with arsenic.

Another perception of the people about arsenic is that the rivers that originated from Himalayas and flow through different canyons, plateau, hills and plains and they dissolved arsenic that is present on this surface of the earth with it. And when these rivers flow through these lands and recharge the under-groundwater then they contaminate the under-groundwater with arsenic and this arsenic contaminated water came-out through the handpumps and tube-wells.

### (ii) People's perception regarding well and pure water

People of this district think that the water from the well is free from arsenic because wells works as a natural filter. Brij Bhushan Jha one of the leader of Samta explained it as there are different

elements, minerals, pebbles, stones and rocks are found in the interior of earth and they filtered the water and then this water come to the wells. That is why the water that come through the wells are free from arsenic and wells works as a natural filter.

(iii) People's perception about Arsenic

Villagers of this district heard something like arsenic in 2007, when there was 'Samta-Megh Pyne Abhiyan' started and then they got to know about the arsenic. Before this intervention villagers of this district have no knowledge or very little knowledge about the arsenic. They think that there something that is present in the water that is known as arsenic and causes cancer and skin diseases. According to them arsenic came-out of the handpumps and tube-wells and drinking this water leads to cancer and other skin diseases. After this intervention the villagers got to know more about the arsenic and its effects over human body and foods.

#### 5.4. Strategies and Mechanism: -

As mentioned above, since the beginning Samta was working on flood and its effect over agriculture, migration, displacement and erosion of lands in this region.

Samta had conducted its different activities mainly by participatory methods. The members of Samta were live among people who is affected by flood and listen to their problems and helped them by providing them a habitation camp and they got food by government with the help of flood relief fund and drinking water by collecting rainwater. They also provided them medical facility.

In the arsenic affected region Samta spread awareness to the villager about arsenic known as 'Samta - Megh Pyne Abhiyan' in 2007. The members of this mission travelled to every villages where they got the patient of cancer and got to find out that how the cancer was spreading in the villages and they find out, they aware the villager that it is the drinking water that leads to the different disease like cancer and others.

The entry level strategies of Samta is through conducting village meeting. And in a village meeting there will be representative of Samta, political leaders, professor, doctor, volunteers are present.

The meetings are held as per need and requirement in the villages or common places such as schools or meeting halls.

The volunteers of Samta are local people, who are from the village and they are mostly student.

Samta mobilize people by giving them information about the sources of arsenic either tube-wells or handpumps. They aware people to use mutka-filter and arsenic filter. They identified the occurrence of arsenic by conducting water testing. They took samples from the villages and send them to the lab for the testing.

They aware people about the drinking water and convinced them to use 'Mutka Filter' and 'Arsenic filter' and to collect rainwater for the drinking water. 'Mutka-Filter' and 'Arsenic-Filter' accepted by many villager, but collection of rainwater for drinking is accepted by few of the villager.

They had taken the samples of different handpumps for the arsenic testing and marked the handpump with red colour that is given arsenic contaminated water. They marked the handpump with red colour so that villager will understand that the water from this handpump is not safe for drinking.

Samta also organises meetings with the villagers at certain intervals with respect to understand their social problems such as - are they getting benefit by the government schemes which is made for them such as Indira Awas Yojna, Sauchalaya Nirman Yojan, MANREGA, Bridha Pension, Widow Pension, Girl Child Marriage Fund and etc.

Snapshot: A day spent on attending meeting on under-ground water and environment.

Red Cross Society

Samta-Megh Pyne Abhiyan

सभा

भुजल पर्यावरण

विषय आधारित कार्यशाला

दिनांक: - 05 जून 2017 समय दिन के 09:30 बजे से 03:00 बजे शाम

स्थान रेड क्रॉस सभागार, खगड़िया

In this meeting Mukhiya of the village Rahimpur said, “There are 129 panchayats in Khagaria and these all panchayat are affected with arsenic contaminated water and mukhiyas of all these panchayats are looking for the clean and pure drinking water. Under-groundwater that we took from handpumps is full of arsenic, iron and bacteria and this water is the major reason for the different kind of diseases like cancer and other skin diseases.”

In this meeting there was a professor from the local college told about the dissolving of arsenic in the river water and under-groundwater. He said, “Defragmentation of Himalayan rocks and the fragments of these rocks have the arsenic within it and when these fragments dissolved in the rivers that flow through these regions it contaminated the water with arsenic and when these rivers water recharge the under-groundwater or meet with under-groundwater by any means it contaminated under-groundwater with arsenic and this water came-out by the handpumps, that people use it as drinking water.”

In this meeting M.L.A. said, “Khagaria is surrounded by arsenic water and government has ignore them for the availability of drinking water. I promise you that in the next parliament session I will raise voice for the availability of pure and clean drinking water in Khagaria.”

#### 5.5. Other NGOs of Khagaria district: -

There are 2 other active NGOs in Khagaria these are – Mahila Sangthan and Ekta but they don't work on water. Only Samta is working on water.

#### 6. Findings and Discussions: -

- There is more iron and arsenic in the water of this district that they people drink and due to this a large number of diseases are occurring such as skin disease and cancer. The main cause of these diseases is drinking water. Approx., every person of the village is suffering with cancer. Diseases of kidney is taking place. Diseases like skin diseases are taking place in which white or black spot emerged on the body, which slowly get tight and rough.
- Due to illness, economic conditions of the people are getting worse. Most of the villagers are daily wage labourer and their wages are at subsistence level. They cannot get to save

money by their daily work, so they are unable to get to proper treatment for diseases like cancer and due to these diseases, their economic conditions are getting worse.

- According to villagers the former science was very good our great grandfathers and grandfathers were used to drink well's water and lived for 100 years but today people become old in 55-60 years. 25 years ago, we used to take water from the well, there was no disease due to drinking water from the well, water was always available in the dug-wells. We stopped taking water from the well for our comfort and started to taking water from handpumps. We started dumping garbage in the dug-wells. As a result of destroying the well, we are on the verge of waste today.
- According to villagers, pond could be another reason to getting arsenic from the handpumps. There is a lot of mud, plastics and other wastage that is sit in the bottom of the pond and it decompose over a long period of time and polluted the water with different chemical pollutant. When this water getting infiltrated from these pond to the underground water and then it gets to the nearby handpumps.
- They are getting to understand that they are drinking poison as water after 2007, when intervention done by Samta over 'Clean and Pure Drinking Water'.
- They are living in the flood prone areas and there is lack of availability of clean drinking water.
- They live in lower plains where handpumps were drowned in the flood and the whole areas fill with mud and silt. The wastage of crops leads them to migration because they have nothing left to eat.
- During the test, it was found that the water of dug-wells is not contaminated by arsenic because the availability of water in dug-wells is 40-45 feet depth and water from dug-wells is clean and pure. The dug-wells have 'Jamot' that filters water and provide it to the dug-wells. There is many kinds of minerals, stones and pebbles found inside the earth, which acts as a filter and its provide clean and pure water to the dug-wells.
- There were ponds and watersheds in the village which used to provide drinking water for the animals and irrigate the cultivated land.
- In 1962, when handpump came they began to take the water from the more depth of the earth because handpumps provide deeper water and the result was that they are drinking arsenic contaminated water. By taking water from handpumps one side they were drinking

arsenic contaminated water and on the other side they are pushing water level down and they are also in the grip of many diseases.

- When health camps organized by Samta with the help of Mahavir Cancer Sansthan they found out that, approx. 90% people of the village is suffering from gastric and approx. 50% people of the village is suffering from diabetes. The main cause for all these diseases is water, every man has an understanding that the water from handpump is contaminated with arsenic.
- There is not lack of underground water but the crisis of water quality has diminished between them. Underground water is mainly used for food and irrigation, so if the lack of availability of clean and pure water is affect the fall on human health.

## 7. Conclusion: -

During my study, I got to know that the whole Khagaria district is affected by arsenic, fluoride and Iron contaminated water. The people of this district are constrained to drink this water. People who is affected by arsenic are called it slow killer, because the effect of arsenic cannot be seen immediately it took long time to accumulate in the human body and when it accumulated over the harmful level it getting show its effect over human body. Due to its long-term accumulation, a very dangerous disease occurred that is cancer. Cancer is a common disease over the people who is affected by arsenic. There are other diseases too that took place due to the accumulation of arsenic such as skin lesions, hard patches on the palms and soles of the feet.

I have found that the villagers have very little knowledge about the arsenic and the diseases cause by it. For their awareness about arsenic contaminated water Samta conducts local intervention with local people and local knowledge. In the interventions they give information to the people about the arsenic contaminated water and tell them to use mutka-filter and arsenic filter for the drinking water and to avoid the diseases causes by arsenic contaminated water.

In the interventions of Samta also provide villagers scientific knowledge about the arsenic with the help of doctors and professors. They strengthen their care for ware against arsenic.

After test conducted by Samata of various sources of waters such as handpumps, dug-wells, river water and rainwater. The arsenic was only found in the handpumps. The dug-wells which was abandoned by the people of this region long time ago is only got bacteria and free from arsenic contamination and according to researchers dug-wells also work as natural filter.

I have found that the region situated near the bank of Ganga are the most arsenic affected region. These regions have more arsenic level than other that is situated far from the bank of Ganga. Researchers said that this is due to the Himalayas because Ganga originated from Himalayas and it passes through many canyons and fields and plateau region that have contains many chemicals and minerals that is dissolved in the water from the flowing of water through this region.

I have also found that the people of this region are very poor, they are daily wage labourer and every member of the family work together to get food, and that is one of the major reason that why these people don't send their children to school for study. They think by teaching their child won't give them to eat but by working they will be able to get food for him and for the family.

Even after the presence of arsenic in the drinking water of Khagaria district, the people of this region are unknowingly using this water. Because the people here have no other source of clean drinking water. They don't have enough facility to get pure and clean drinking water it.

## 8. Annexure 1: Water Testing Report 2015

Village – Chaidha

Bock – Mansi

Panchayat – Purvi Thatha

District – Khagaria

S. No.	Code	Source	Date	Owner	P. H.	D.O	R Chlorine	Turbidity	Chloride	Nitrate	Phosphorus	Fluoride	Iron	Hardness	Ammonia	Arsenic	Coliform
						Mg/l	Mg/l	NTU	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	
1	CH-1	HP	20/06/2015	Jagan Paswan	7	0.8	Nil	15	14.18	Nil	0.1	0.6	3.0	224	Nil	400	Yes
2	CH-2	HP	20/06/2015	Ram Bilas Paswan	7	1.6	Nil	15	21.27	Nil	0.1	0.6	3.0	192	Nil	Nil	Yes
3	CH-3	HP	20/06/2015	Grish Paswan	7		Nil	15	28.36	Nil	0.1	0.6	3.0	160	Nil	400	Yes
4	CH-4	HP	20/06/2015	Mantun Paswan	7		Nil	25	14.18	Nil	0.1	0.6	3.0	216	Nil	20	No
5	Ch-5	HP	20/06/2015	Suresh Paswan				Closed									
6	CH-6	HP	20/06/2015	Nandan Paswan	7	0.8	Nil	15	21.27	Nil	0.1	0.6	3.0	208	Nil	100	No

7	CH-7	HP	20/06/2015	Pramod Paswan	7	1.6	Nil	15	21.27	Nil	0.1	0.6	3.0	176	Nil	400	No
8	CH-8	HP	20/06/2015	Lakhan Paswan	7	0.8	Nil	10	14.18	Nil	0.1	0.6	3.0	192	Nil	10	No
9	CH-9	HP	21/06/2015	Arvind Paswan	7	0.8	Nil	25	14.18	Nil	0.5	0.6	3.0	176	Nil	200	No
10	CH-10	HP	21/06/2015	Chamru Paswan	7	0.8	Nil	25	14.18	Nil	0.5	0.6	3.0	208	Nil	Nil	No
11	CH-11	HP	21/06/2015	Aklu Paswan	7	0.8	Nil	15	14.18	Nil	0.5	0.6	3.0	240	Nil	10	Yes
12	CH-12	HP	21/06/2015	Sikandar Paswan	7	0.8	Nil	25	21.27	Nil	0.5	0.6	3.0	240	Nil	50	Yes
13	CH-13	HP	21/06/2015	Manoj Paswan	7	2	Nil	25	21.27	Nil	0.5	0.6	3.0	288	Nil	50	No
14	CH-14	HP	21/06/2015	Ramchandra Paswan	7	0.8	Nil	25	14.18	Nil	0.5	0.6	3.0	240	Nil	100	No
15	CH-15	HP	21/06/2015	Ram Paswan	7	0.8	Nil	25	21.27	Nil	0.5	0.6	3.0	240	Nil	200	No
16	CH-16	HP	21/06/2015	Dayand Paswan	7	0.8	Nil	25	21.27	Nil	0.5	0.6	3.0	320	Nil	Nil	No
17	CH-17	HP	21/06/2015	Prakash Paswan	7	2	Nil	50	21.27	Nil	0.5	0.6	3.0	280	Nil	10	Yes

18	CH-18	HP	22/06/2015	Indradeo Paswan	7	1.2	Nil	25	35.45	Nil	0.5	0.6	3.0	280	Nil	50	Yes
19	CH-19	HP	22/06/2015	Ashok Das	7	1.6	Nil	25	21.27	Nil	0.5	0.6	3.0	304	Nil	20	Yes
20	CH-20	HP	22/06/2015	Dilip Das					Closed								Yes
21	CH-21	HP	22/06/2015	Binay K.Das	7	1.6	Nil	50	35.45	Nil	0.5	0.6	3.0	280	Nil	10	Yes
22	CH-22	HP	22/06/2015	Manoj K. Das	7	1.2	Nil	15	35.45	Nil	0.5	0.6	3.0	336	Nil	10	Yes
23	CH-23	HP	22/06/2015	Uday K. Das	7	1.6	Nil	25	21.27	Nil	0.5	0.6	3.0	168	Nil	50	Yes
24	CH-24	HP	22/06/2015	Kishor K. Das	7	1.6	Nil	25	21.27	Nil	0.5	0.6	3.0	280	Nil	20	Yes
25	CH-25	HP	22/06/2015	Dinesh K. Das	7	2	Nil	25	14.18	Nil	0.5	0.6	3.0	320	Nil	10	Yes
26	CH-26	HP	22/06/2015	Vikhan Das	7	1.2	Nil	25	7.09	Nil	0.5	0.6	3.0	304	Nil	10	Yes
27	CH-27	HP	22/06/2015	Chandan Das	7	1.2	Nil	25	7.09	Nil	0.5	0.6	3.0	312	Nil	20	Yes

28	CH-28	HP	22/06/2015	Primary School Chaidha	7	2	Nil	10	7.09	Nil	0.5	0.6	3.0	280	Nil	20	No
29	CH-29	HP	23/06/2015	Surendra Das	7	2	Nil	25	14.18	Nil	0.5	0.6	3.0	320	Nil	10	Yes
30	CH-30	HP	23/06/2015	Arvind Das					Closed								
31	CH-31	HP	23/06/2015	Prabin Das	7	1.6	Nil	25	28.36	Nil	0.5	0.6	3.0	280	Nil	50	No
32	CH-32	HP	23/06/2015	Pinku Das					Closed								
33	CH-33	HP	23/06/2015	Srikant Paswan	7	0.8	Nil	25	14.18	Nil	0.1	0.6	3.0	264	Nil	10	Yes
34	CH-34	HP	23/06/2015	Ram Paswan	7	0.8	Nil	50	14.18	Nil	0.5	0.6	3.0	264	Nil	Nil	No
35	CH-35	HP	23/06/2015	Deban Paswan	7	2.4	Nil	25	21.27	Nil	0.5	0.6	3.0	264	Nil	Nil	No
36	CH-36	HP	23/06/2015	Aklu Paswan	7	0.8	Nil	50	14.18	Nil	0.5	0.6	3.0	248	Nil	10	Yes
37	CH-37	HP	23/06/2015	Akhilesh Paswan	8	0.8	Nil	25	14.18	Nil	0.5	0.6	3.0	264	Nil	Nil	No

38	CH-38	HP	23/06/2015	Pramod Paswan	7	3.2	Nil	10	42.54	Nil	0.1	0.6	1.0	408	Nil	10	No
39	CH-39	HP	24/06/2015	Jay Lal Paswan	7	2.4	Nil	25	21.27	Nil	0.5	0.6	3.0	264	Nil	Nil	No
40	CH-40	HP	24/06/2015	Ashok Paswan	7	2	Nil	10	14.18	Nil	0.5	0.6	3.0	248	Nil	50	No
41	CH-41	HP	24/06/2015	Ratan Paswan	7	1.2	Nil	15	21.27	Nil	0.5	0.6	3.0	280	Nil	10	No
42	CH-42	MUT	24/06/2015	Mutka Filter	7	1.2	Nil	0	14.18	Nil	0.1	0.6	3.0	216	Nil	Nil	No
43	CH-43	HP	24/06/2015	Mira Devi	7	2	Nil	25	28.36	Nil	0.5	0.6	3.0	256	Nil	10	No
44	CH-44	HP	24/06/2015	Indradeo Paswan	7	1.2	Nil	25	21.27	Nil	0.5	0.6	3.0	320	Nil	10	Yes
45	CH-45	HP	24/06/2015	Bidhan Paswan	7	2	Nil	10	14.18	Nil	0.1	0.6	3.0	352	Nil	20	No
46	CH-46	HP	24/06/2015	Nathuni Paswan	7	2	Nil	10	14.18	Nil	0.1	0.6	3.0	272	Nil	10	No
47	CH-47	HP	24/06/2015	Bijo Paswan	7	2.4	Nil	50	14.18	Nil	0.1	0.6	3.0	312	Nil	10	No
48	CH-48	HP	24/06/2015	Kedar Paswan	7	2	Nil	10	14.18	Nil	0.1	0.6	3.0	264	Nil	100	No

49	CH-49	HP	25/06/2015	Ramanand Paswan	7	2	Nil	25	21.27	Nil	0.1	0.6	3.0	248	Nil	100	Yes
50	CH-50	HP	25/06/2015	Yogendra Paswan	7	3.6	Nil	15	21.27	Nil	0.5	0.6	3.0	248	Nil	20	No
51	CH-51	HP	25/06/2015	Bandh Saran Asthali	7	3.6	Nil	15	14.18	Nil	0.1	0.6	3.0	272	Nil	50	No
52	CH-52	HP	25/06/2015	Sultan Singh	7	2.4	Nil	10	42.54	Nil	0.1	0.6	3.0	424	Nil	200	No
53	CH-53	HP	25/06/2015	Arjun Sharma	7	2.4	Nil	10	14.18	Nil	0.1	0.6	3.0	264	Nil	10	No
54	CH-54	HP	25/06/2015	Maheshwar Paswan	7	2	Nil	10	14.18	Nil	0.1	0.6	3.0	232	Nil	20	No
55	CH-55	HP	25/06/2015	Dharmendra Sharma	7	1.2	Nil	10	14.18	Nil	0.1	0.6	3.0	248	Nil	10	No
56	CH-56	HP	25/06/2015	Ranjit Paswan	7	3.6	Nil	10	14.18	Nil	0.1	0.6	3.0	232	Nil	200	No
57	CH-57	HP	25/06/2015	Sakaldeo Paswan	7	2.4	Nil	10	14.18	Nil	0.1	0.6	3.0	192	Nil	10	No
58	CH-58	HP	25/06/2015	Bhola Paswan	7	3.2	Nil	10	21.27	Nil	0.1	0.6	3.0	240	Nil	Nil	No

59	CH-59	HP	25/06/2015	Pramod Das	7	0.8	Nil	10	21.27	Nil	0.5	0.6	3.0	248	Nil	20	No
60	CH-60	HP	26/06/2016	Government Ram	X	X	X	X	X	X	X	X	X	X	X	X	X
61	CH-61	RV	26/06/2016	Budhi Gandak	7	5.2	Nil	25	35.45	Nil	0.1	0.6	1.0	176	Nil	10	No
62	CH-62	BOR	26/06/2016	Niraj Singh	X	X	X	X	X	X	X	X	X	X	X	X	X
63	BA-1	HP	26/06/2016	Akhilesh Singh	7	1.2	Nil	10	14.18	Nil	0.5	0.6	3.0	160	Nil	200	No
64	BA-2	HP	26/06/2016	Primary School	7	2	Nil	25	14.18	Nil	0.1	0.6	3.0	312	Nil	10	No
65	BA-3	HP	26/06/2016	Kabir Math East	7	1.6	Nil	10	14.18	Nil	0.1	0.6	3.0	384	Nil	200	No
66	BA-4	DW	26/06/2016	Kabir Math East	8	1.6	Nil	15	14.18	Nil	0.5	0.6	0.3	304	Nil	Nil	No
67	BA-5	BOR	29/06/2016	Boring Kabir Math East	X	X	X	X	X	X	X	X	X	X	X	X	X
68	CB-1	HP	29/06/2016	Chaidha Banni Halt	7	4.8	Nil	50	21.27	Nil	0.5	0.6	3.0	312	1.0	10	No

69	CH-63	HP	29/06/2016	Kami Paswan (South)	7	2.4	Nil	25	21.27	Nil	0.5	0.6	3.0	288	Nil	Nil	Yes
70	CH-64	HP-1	29/06/2016	Middle School Chaidha	7	0.4	Nil	15	21.27	Nil	0.5	0.6	3.0	320	Nil	50	No
71	CH-65	HP-2	29/06/2016	Middle School Chaidha	7	1.2	Nil	15	21.27	Nil	0.5	0.6	3.0	272	Nil	200	No
72	CH-66	HP	29/06/2016	Kumud Paswan	X	X	X	X	X	X	X	X	X	X	X	X	X
73	CH-67	BOR	29/06/2016	MPA BOR	7	1.2	Nil	15	21.27	Nil	0.5	0.6	3.0	Nil	Nil	100	No

(Source: Samta, Khagaria)

Index: -

1. 'CH-1, 2,' - households of village 'Chaidha'.
2. 'BA' – Banni.
3. 'CB' – Chaidha-Banni Halt.
4. 'HP' – Hand-pump.
5. 'HP-1' and 'HP-2' – two handpumps in a school.
6. 'RV' – River.
7. 'DW' – Dug-Dug-wells

This arsenic testing report contains the samples of 67 handpumps, 1 dug-dug-wells, 3 borings, 1 river and 1 mutka filter. During this test, they found 6 closed handpumps.

This testing was done by Samta, Khagaria from – 20/06/2015 to 29/06/2015. There are few other households besides panchayat Chaidha, they also took the nearby households of nearby villages that is situated near Chaidha such as Banni and Chaidha-Banni Halt.

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