



Water Sources Assessment Report. Bagh Town.

Date: 3rd July, 2006

WATSAN Task Force (Bagh):

1. Public Health Engineering Department (PHED)
2. Local Government Rural Development Department (LGRDD)
3. Municipal Corporation Bagh (MCB)
4. World Health Organization (WHO)
5. United Nation International Children Emergency Fund (UNICEF)
6. OXFAM Great Britain
7. American Refugee Committee (ARC)

Report prepared by WHO team, Bagh Hub.

1. Engr. Imran Mukhtar, Environmental Health Officer.
2. Dr. Musa Rahim Khan, Public Health Officer.
3. Dr Muhammad Fawad Khan, Epidemiologist/Disease Surveillance Coordinator.



WORLD HEALTH ORGANIZATION
BAGH HUB

BACKGROUND:

District Bagh is one of the eight Districts of Azad Jammu & Kashmir. Bagh town is District Headquarter (DHQ) and main town of the District situated at the convergence point of two main Nallas; Mahl and Malvani. Total area of Bagh town is 50Sq.Km. There are total 6385 Households with an estimated population of 32289. Being district headquarter, Bagh town accommodates public departments, buildings, residences, commercial markets and hotels. Before Octobers Earthquake there was no proper sewerage system available in the town so individual septic tanks were used to meet the purpose. Public Health Engineering Department (PHED) was responsible for water supply and Municipal Corporation Bagh for solid waste management of the town. The 8th October earthquake not only damaged the buildings in the town but also affected the water supply, sewerage, water drainage and solid waste disposal as a result posing a great risk for the health of the people. To address this issue the Deputy Commissioner advised to form a task force to assess the water supply of Bagh town.

Water supply system of Bagh town:

PHED is responsible for the water supply of the town; with its present capacity the department is covering only 15 to 20 thousand populations through three water sources. Two of the water sources are in the main town near to PHED office which feeds the main supply system for the town by pumping while the third source is at Chowky which supplies almost one hundred households by gravity flow. PHED is supplying 250000 Gallons of chlorinated water by pumping and 40000 Gallons of chlorinated water through tankers per day. The water coming from the Chowky source is also safe (according to PCRWR report) which is 50000 Gallons per day. Beside these sources, the people of Bagh consume water from numerous unprotected springs.

Assessment of water sources of Bagh town:

WHO WATSAN Bagh did water quality testing and reported water contamination at different water sources in Bagh town. In response to this report, Deputy Commissioner,

Bagh advised to form a Task Force for a detailed assessment of water sources of the town. WATSAN Technical Advisory Group made a Task Force to check the water and sanitation conditions, which comprised of:

- PHED leading the Task Force (Irshad Ahmed SDO and Sajjad Haider Sub Engr.)
- Local Government Rural Development Department (LRRDD) (Naseem Abbasi SDO and Shakil Ahmed Sub Engr.).
- Municipal Corporation Bagh (MCB) (Syed Sadaqat Gardazi Administrator, Tariq Abbasi Sub Engr.).
- WHO (Engr. Imran Mukhtar Environmental Health Officer water testing and reporting, Dr. Musa Rahim Khan, Public Health officer, Dr. Muhammad Fawad Khan, Disease surveillance Coordinator).
- UNICEF (Sheraz Shah).
- OXFAM (Malik Tahir WATSAN Engineer water testing)
- ARC.

Objectives:

- Identifying the main water source in Bagh town.
- Water quality testing at sources, distribution networks and end users.
- Identification of water contamination points if any.
- Development of recommendations to improve safe water supply and to reduce health risks.

Methodology:

- Desk analysis of water supply system with identification of the water sources and assessment plan.
- Beside the main PHED water sources other major springs from where a large proportion of the population get their water for daily consumption were identified
- Physical observation of the water sources, its surroundings and distribution network was assessed for its general cleanliness and possible source of contamination.
- Water quality testing (for contamination, residual Chlorine, Turbidity and pH) at sources, distribution points, households and schools (end users) through convenience sampling.
- Water quality tested with DelAgua water testing kit (for pH, residual chlorine and number of faecal coliforms) and PCRWR H₂S water testing (for presence of faecal coliforms) at sources, distribution networks and end users.

Standards for safe drinking water:

DelAgua	Values
No. of coli forms	0 fit/safe for drinking purposes >0 unfit/Unsafe for drinking purposes
Residual chlorine	0.5-0.2mg/l
pH	6.5-8.5
Turbidity	<5NTU

PCRWR H2S water testing kit:

Comparison of formation of black coloration with PCRWR Evaluation chart for bacterial contamination:

No coliforms	No change in colour / fit for drinking
Presence of Coliforms	Slightly black discoloration indicating presence of coliforms / unfit for drinking

Assessment Results:

A large proportion of population in Bagh town gets their drinking water from unprotected water sources (springs) which are highly contaminated. All the sources (springs) are not protected while general cleanliness conditions of these springs and its surroundings are poor. Water from these springs could be a major source of water born diseases like Acute Watery Diarrhoea, Bloody diarrhoea, Typhoid fever and Hepatitis A & E.

Proper protection of these sources can reduce the risk for these diseases. During the monsoon season, the chances for water born diseases might increase and even pose threat for epidemic outbreaks. People also use the same sources for bathing and washing which further increases this hazard.

The pictures below show some of major water sources (springs) located at different parts of the Bagh town, with some activities at the source about its use and location.

Unprotected water sources in Bagh town:



N33° 58.707' E73° 46.549' Alt. 3489'
By pass Road near T11 water tanks



N33° 58.697' E73° 46.539' Alt. 3478'
By pass Road near Forest office



N33° 58.662' E73° 46.576' Alt. 3483'
Bypass Road



N33° 58.544' E73° 46.931' Alt. 3536'
Bypass Road near Spring field Sch.



N33° 58.561' E73° 46.933' Alt. 3534'
Channel of spring near SFS



N33° 58.681' E73° 46.714' Alt. 3508'
Bypass Road near National Science College



N33° 58.479' E73° 46.920' Alt. 3534'
Bypass Road near Mosque



N33° 58.405' E73° 47.029' Alt. 3544'
Bypass Road near Shell petrol Pump



N33° 58.406' E73° 47.025' Alt. 3544'
Bypass Road near Shell petrol Pump



N33° 59.052' E73° 47.812'
Alt. 3994'



N33° 59.052' E73° 47.782'
Alt. 3989'



N33° 58.938' E73° 47.698'
Alt. 3939'

Huda Bari



N33°59.054', E73°47.827', Alt.4040'
Huda Bari



N33° 58.647' E73° 46.112'
Alt. 3442 near NRSP Office



N33° 58.253' E73°47.333' Alt.3637'
Close to Former Muslim Hands camp

Water samples from 25 water sources (springs), ten distribution points and five households were tested. Out of these 25 samples from the water sources only 3 (12% of total water sources checked) are fit for drinking at the source according to WHO standards. For rest of the sources 22 (88%) water is not safe for drinking at source. One of the PHED water sources is also highly contaminated; however it is made safe after chlorination. Test results show that the contamination of the water from source to the house hold pots increased and contamination is found to be alarmingly high at household level. This indicates handling of the water storage is not done hygienically at house level. The table below shows the water sample test results.

WATER (DelAgua) SAMPLES TEST RESULTS

S.No.	Source Type	Location	Color	Odour	Taste	PH	Turbidity (NTU)	F.C/100ml	Remarks (According to WHO Guideline)
1	Spring 1 PHED Major source	N33° 59.175' E73° 46.389' Alt. 3551'	Nil	Nil	Nil	7.6	<5	0	Fit for Drinking
2	Spring 2 PHED minor source	N33 59.061' E73 46.404' Alt. 3527'	Nil	Nil	Nil	7.6	<5	202	Unfit For Drinking
3	Spring 3 close to Alkharia Madrassa	N33° 59.091' E73° 46.374' Alt. 3541'	Nil	Nil	Nil	7.6	<5	2	Unfit For Drinking
4	Spring 4 By pass Road near T11 water tanks	N33° 58.707' E73° 46.549' Alt. 3489'	Nil	Nil	Nil	7.4	<5	310	Unfit For Drinking
5	Spring 5 By pass Road Near Forest office	N33° 58.697' E73° 46.539' Alt. 3478'	Nil	Nil	Nil	7.4	<5	28	Unfit For Drinking
6	Spring 6 By pass road	N33° 58.662' E73° 46.576' Alt. 3483'	Nil	Nil	Nil	7.4	<5	40	Unfit For Drinking
7	Spring 7 Bypass Road near National Science College	N33° 58.681' E73° 46.714' Alt. 3508'	Nil	Nil	Nil	7.2	<5	306	Unfit For Drinking
8	Spring 8 Bypass Road near Spring field school	N33° 58.544' E73° 46.931' Alt. 3536'	Nil	Nil	Nil	7.2	<5	168	Unfit For Drinking
9	Channel to spring 8 Source for Tap stand close to Mercy Corps office	N33° 58.561' E73° 46.933' Alt. 3534'	Nil	Nil	Nil	7.2	<5	<i>Uncountable</i>	Unfit For Drinking
10	Spring 9 Bypass Road near Mosque	N33° 58.479 E73° 46.920 Alt. 3534	Nil	Nil	Nil	7.4	<5	6	Unfit For Drinking
11	Spring 10A By pass near Shell Pump	N33° 58.405' E73° 47.029' Alt. 3544'	Nil	Nil	Nil	7.4	<5	45	Unfit For Drinking
12	Spring 10B By pass near Shell Pump	N33 58.406' E73 47.025' Alt. 3544'	Nil	Nil	Nil	7.4	<5	40	Unfit For Drinking
13	Spring 11 near NRSP office	N33° 58.647' E73° 46.112' Alt. 3442'	Nil	Nil	Nil	7.4	<5	40	Unfit For Drinking
14	Spring 12 Near Former Muslims hands camp	N33° 58.253' E73°47.333' Alt.3637'	Nil	Nil	Nil	7.2	<5	0	Fit For Drinking
15	Spring 13 near Former Muslims hands camp	N33° 58.300' E73°47.299' Alt.3558'	Nil	Nil	Nil	7.6	<5	20	Unfit For Drinking

16	Spring 14 near Noorani Basti	N33° 58.308' E73° 47.290' Alt.3544'	Nil	Nil	Nil	7.6	<5	48	Unfit For Drinking
17	Well	N33° 58.507' E73° 46.991' Alt. 3543'	Nil	Nil	Nil	7.4	<5	<i>Uncountable</i>	Unfit For Drinking

Water test results from house hold pots using the above mentioned spring sources

18	H# 1 using spring 5 Near forest office	N33° 58.689' E73° 46.591 Alt. 3480	Nil	Nil	Nil	7.4	<5	130	Unfit for Drinking
19	H# 2 using Channel to spring 8	N33° 58.679' E73° 46.732' Alt. 3509'	Nil	Nil	Nil	7.2	<5	<i>Uncountable</i>	Unfit For Drinking
20	H# 3 using spring 7	N33° 58.593' E73° 46.956' Alt. 3555'	Nil	Nil	Nil	7.2	<5	274	Unfit For Drinking
21	H# 3 using spring 14	N33° 58.300' E73° 47.278' Alt.3488'	Nil	Nil	Nil	7.6	<5	56	Unfit For Drinking
22	National science college source near Mosque	N33° 58.665' E73° 46.717' Alt. 3458'	Nil	Nil	Nil	7.4	<5	167	Unfit For Drinking

Water sample test results with PCRWR H2S water testing Kit confirmed with PCRWR Collitage Method.

S. No.	Source Type	Location	Color	Odour	Taste	PH	Turbidity (NTU)	Results *	Remarks
23	Spring 15 Near Huda Bari Kashmiri Refugees camp	N33° 59.052' E73° 47.812' Alt. 3994'	Nil	Nil	Nil	7.4	<5	Positive	Unfit for drinking purposes
24	Stream 16 Near Huda Bari Kashmiri Refugees camp	N33° 59.052' E73° 47.782' Alt. 3989'	Nil	Nil	Nil	7.6	<5	Positive	Unfit for drinking purposes
25	Stream 17 Near Huda Bari Kashmiri Refugees camp	N33° 58.938' E73° 47.698' Alt. 3939'	Nil	Nil	Nil	7.4	<5	Positive	Unfit for drinking purposes
26	Spring 18 Near Huda Bari Kashmiri Refugees camp	N33°59.054', E73°47.827', Alt.4040'	Nil	Nil	Nil	7.4	<5	Positive	Unfit for drinking purposes
27	Spring 19 Near Huda Bari Kashmiri Refugees camp	N33°58.844', E73°47.605', Alt.3903'	Nil	Nil	Nil	7.6	<5	Positive	Unfit for drinking purposes
28	Spring 20 YaqoobAbad	N33° 58.638' E73° 45.977' Alt. 3427'	Nil	Nil	Nil	7.2	<5	Positive	Unfit for drinking purposes
29	Spring 21 YaqoobAbad	N33° 58.635' E73° 46.019' Alt. 3415'	Nil	Nil	Nil	7.2	<5	Positive	Unfit for drinking purposes
30	Spring Padar Gulsher Khan	N34°01.700', E73°46.736', Alt.4872'	Nil	Nil	Nil	7.4	<5	Negative	Fit for drinking purposes



Water sample test results from different water sources of Bagh town

Observations and Conclusions:

- A large proportion of Bagh population use unprotected water sources (springs) for drinking. The same sources are also used for bathing and washing
- People are not using chlorinated water. They prefer to use water directly from springs
- Out of the 25 water samples checked by the task force only 3 (12%) are fit for drinking at the source according to WHO standards. This is a potential threat for the health of children, women and men, in the town
- The water contamination level at the household is very high compared to the contamination at source indicating unhygienic handling and storage
- School going children drink water directly from sources (springs) using their hands
- The residual chlorine level at end users points was 0.2mg/l, which is according to the standards
- The present quantity of water supply through PHED is not enough as required in the town
- Although the living standards of the people is high and are well aware about personal hygiene but they lack knowledge about the safe drinking water
- There is no proper sewerage disposal system in the town and even the existing septic tanks of houses and public department buildings and hotels are either cracked or damaged due to the earthquake, which is the major cause of ground water contamination
- There is no proper solid waste disposal system in the town. Drains are full of garbage and sewage, which also increases the water contamination as during rains the drains become full, choked and overflows into adjacent Nallas, open fields and percolate into the underground water aquifer

Action taken:

- Protection of two major water sources by PHED is in progress.
- OXFAM provided one (T-70) water tank to PHED, due to which chlorinated water will be available to two more areas.



Two main water sources under construction by PHED

Recommendations:

- Proper protection of water sources (springs).
- Continue chlorination of the water and motivation of the people to use chlorinated water.
- Active health & hygiene education and promotion.
- Enhance public awareness about the use of safe drinking water.
- Establishment of proper sewerage system along with safe disposal system (i.e. disposal after treatment) in the town.
- Provision of chlorinated water for the whole town by increasing the capacity of PHED.
- Strengthening capacity of PHED & MCB for improvement of safe water supply, sewerage system and solid waste management in the town
- Collaborative efforts of WATSAN partners to improve the situation.



Our Future Let's protect them!!!