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Research Article

To Study the Domestic As Well As Community Storage Systems With Respect To Quality of Water and Health Status of the Common People

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Abstract: This study has investigated domestic as well as community storage system with respect to quality of water & health status of common people. The type of storage container & hand contact with stored drinking water has been associated with increased incidence of diarrheal diseases. There is also circumstantial evidence of linking such factors as the sanitary conditions in the domestic environment, cultural norms & poverty with the pathogen load of household stored drinking water & hence the risk of diseases transmission. Drinking water provision indicated that the community was exposed to water related health risk when consuming the water supplied. The study indicated that although the public water supply was of good quality, the stored water, once fetched from the standpipes, deteriorated the quality which often was not safe for human consumption.

Monthly water samples were collected from containers kept inside the houses & overhead tanks of selected families. Parameters were analyzed mainly TDS, sulphates, chlorides, hardness, residual chlorine, biological parameter (MPN). The reason for the deterioration varied from poor container hygiene & open containers subjected to environmental pollution, to the manner of handling of water by individuals in households

Keywords: deterioration, drinking water, water quality parameters, health risk, environmental pollution, container-stored water quality.

INTRODUCTION

Studies have shown that collecting water from these taps, as well as storing it in, and handling it from containers at home cause quality deterioration to such an extent that the water poses potential risks of infection to consumers. Much of the world's population remains without accesses to the portable water supplies and adequate methods to dispose human fecal waste. Population and anthropogenic human activities along the bank of river's is causing pollution of water, air and soil and are contributing to increasing number of human diseases worldwide. As per the WHO estimates 1.1 billion people lack access to an improved drinking water supply many more drinks water that is grossly contaminated.

The main water-borne/faecal oral diseases are:

1. ***Typhoid fever***
2. ***Giardia***
3. ***Dysentery***
4. ***Cholera***
5. ***Diarrhea (caused by a variety of pathogens)***
6. ***Hepatitis***
7. ***Polio***

- In developing countries four-fifths of all illness is caused by water borne diseases, with diarrhea being the leading cause of childhood death.
- Floodwaters can carry with it raw sewage, slit, oil or chemicals wastes cause diarrhea and dysentery.
- Infectious diseases caused by pathogenic bacteria, viruses, and protozoa are the most common and wide spread health risk associated with drinking water.

Table-1: I.S. Limits for Drinking WATER

Parameters	**Desirable Limit**	**Permissible Limit**
Turbidity	5NTU (max.)	10NTU
p^H	6.5 – 8.5	6.5 – 8.5
Total hardness	300 ppm (max.)	600 ppm
Chloride	250 ppm (max.)	1000 ppm
Residual chlorine	0.2 ppm (min.)	--
Nitrate	45 ppm (max.)	100 ppm
Alkalinity	200 ppm (max.)	600ppm
Coliform	-	10/100 ml
E. Coli	-	0/100 ml

THE STUDY AREA

All though Puneties get treated water from PMC pumping station, but still there are some noticeable water borne diseases found in some area of Pune hence one should know whether there is or there are any reason which make water non-potable when it reach the consumers end or is there any mistake by the consumer itself in storage. The reason I carried out my dissertation on this topic is to study the quality of water storage in the houses of people in Pune region, to study the drinking water system and storage system of people living in Pune.

METHODOLOGY

Water quality testing: For the analysis of storage system with respect to quality of water and health status of common people, for that several sites were selected in Pune City[15]. My topic is basically related with the storage system of the water. In Pune city most of the dwellers use bore well and water provided by the PMC. So we have chosen PMC and Bore well water resource for the selection procedure.

The PMC water resources are well treated before supplying to different area and apartments. To verify is there any change in quality of the water after storage and how that water affects the human health. People in this apartment use that water for various household activities like bathing, gardening, drinking, flushing etc therefore to know about change water quality and how to affect that water to human being. So we have chosen domestic water storage system for our dissertation. We also conducted the survey of water availability, storage systems and health status of people in selected sites.

Table 2: Sampled water sources at selected site.

Area	PMC Water Supply	Ground Water
Dhankawadi	YES	
Taljai vasahat	YES	
Padmavati	YES	
Swargate	YES	YES
Raviwar Peth	YES	
Narayan Peth	YES	YES
Shaniwar Peth	YES	
Sinhgad road	YES	
M. G. Road	YES	

Table 3.1: Values of Hydrological parameters in the month of August at different locations

Sampling Sites		Dhankawadi	Taljai vasahat	Padmavati	Swargate	Raviwar Peth	Narayan Peth	Shaniwar Peth	Sinhgad Road	M.G. Road
Parameters										
MPN/100ml	A	2	8	2	0	2	0	2	12	0
	B	2	10	0	5	0	11	0	14	2
Hardness (mg/lit)	A	50	55	45	50	75	85	55	65	70
	B	50	60	60	250	65	145	75	90	80
Chloride (mg/lit)	A	31.90	28.36	21.27	35.45	21.27	53.17	81.53	109.89	49.63
	B	24.81	24.81	24.81	131.90	138.25	177.25	202.06	223.33	46.08
Residual Chlorine (mg/lit)	A	0.3	0.1	0.4	0.3	0.3	0.3	0.3	0.1	0.4
	B	0.3	0.1	0.4	0.1	0.3	0	0.4	0.1	0.3
Sulphate (mg/lit)	A	14.14	36.42	7.71	6.429	25.71	16.71	7.71	1.28	1.28
	B	34.72	11.57	7.71	90.01	38.57	90.01	18.00	90.01	1.28
pH	A	7.18	6.78	6.57	6.69	7.06	7.11	6.97	6.92	7.29
	B	7.12	6.71	6.67	7.4	6.53	7.24	6.86	7.48	7.29
Turbidity(NTU)	A	1.1	0	0	0.1	1	-0.2	-0.3	-0.3	0
	B	1.1	0.1	0.1	0.1	-0.2	-0.7	0.5	-0.2	0.4
T.D.S. (mg/lit)	A	106.52	180	100	250	180	200	195	183.19	180
	B	116	140	210	400	248	490	302.35	410	135

(A) – Drinking water (B) - Over Head Tank

Table 3.2: Values of Hydrological parameters in the month of September at different locations

Sampling Sites		Dhankawadi	Taljai vasahat	Padmavati	Swargate	Raviwar Peth	Narayan Peth	Shaniwar Peth	Sinhgad Road	M.G. Road
Parameters										
MPN/100ml	A	2	10	2	0	8	0	0	8	0
	B	2	12	2	4	10	2	0	15	0
Hardness (mg/lit)	A	50	54	52	70	90	87	55	71	67
	B	55	67	62	254	68	200	72	91	77
Chloride (mg/lit)	A	32.21	30.19	32	28	21.27	30.15	40.39	90.27	52.22
	B	23.68	28.94	28.41	25.4	160.2	55.66	177.6	198.4	46.58
Residual Chlorine (mg/lit)	A	0.3	0.1	0.2	0.3	0.1	0.3	0.4	0.1	0.4
	B	0.3	0.1	0.2	0	0.2	0.1	0.4	0.1	0.4
Sulphate (mg/lit)	A	7.45	8.65	5.01	6.45	20.15	14.78	5.32	2.64	1.55
	B	30.25	10.48	88.14	68.21	8.25	39.21	15.21	88.59	1.25
Ph	A	7.19	6.25	7.25	6.59	7.56	6.95	7.05	6.32	7.46
	B	6.24	6.71	6.68	7.49	6.89	7.25	6.35	6.51	7.12
Turbidity (NTU)	A	1.1	0.2	1.1	0	1.3	-0.1	-0.1	0.1	0
	B	1.2	1.1	0.5	1.1	1.2	0.7	1.5	0.2	1.4
T.D.S. (mg/lit)	A	100	165	97.56	245	185	189	143	170	186
	B	116	154	198	335	244	300	272	384	133

Table 3.3: Values of Hydrological parameters in the month of October at different locations

Sampling Sites		Dhankawadi	Taljai vasahat	Padmavati	Swargate	Raviwar Peth	Narayan Peth	Shaniwar Peth	Sinhgad Road	M.G. Road
Parameters										
MPN/100ml	A	0	14	0	0	4	0	0	11	0
	B	0	17	10	5	5	8	0	17	2
Hardness (mg/lit)	A	55	60	60	75	70	65	55	60	65
	B	60	70	60	250	70	205	75	80	70
Chloride (mg/lit)	A	28.46	42.54	42.54	31.9	22.27	28.36	38.99	81.89	46.08
	B	24.81	53.17	53.17	31.9	130.24	46.08	42.54	123.3	49.163
Residual Chlorine (mg/lit)	A	0.4	0.1	0.2	0.2	0.1	0.3	0.4	0.1	0.3
	B	0.4	0.1	0.2	0.1	0.1	0.1	0.4	0.1	0.2
Sulphate (mg/lit)	A	15.14	27.04	45.07	56.58	20.61	15.43	37.29	2.2	1.28
	B	30.72	7.71	54.09	55.07	35.58	32.148	38.57	80.15	1.45
pH	A	7.12	7.27	7.25	7.3	7.07	7.12	7.46	6.97	7.07
	B	7.18	7.23	7.51	7.35	7.1	7.35	7.43	7.48	7.24
Turbidity (NTU)	A	1.2	0.6	0.6	1.5	1.1	1.1	-1.1	1.1	0.3
	B	1.1	0.4	-0.3	0.8	1.1	0	1.1	1.1	1.2
T.D.S. (mg/lit)	A	107	260	300	260	140	260	150	152	140
	B	124	138	190	345	244	290	200	290	170

Table 3.4: Values of Hydrological parameters in the month of November at different locations

Sampling Sites		Dhankawadi	Taljai vasahat	Padmavati	Swargate	Raviwar Peth	Narayan Peth	Shaniwar Peth	Sinhgad Road	M.G. Road
Parameters										
MPN/100ml	A	2	10	0	0	0	2	0	10	0
	B	2	12	0	14	0	9	4	14	2
Hardness (mg/lit)	A	50	55	57	72	87	62	65	65	60
	B	55	68	65	200	90	200	75	90	65
Chloride (mg/lit)	A	30.2	30.32	42.11	23.63	30.51	20.66	28.64	90.21	40.66
	B	23.66	27	30.84	30.9	40.61	125.32	40.33	210	46.35
Residual Chlorine (mg/lit)	A	0.2	0.1	0.3	0.3	0.3	0.1	0.4	0.1	0.3
	B	0.2	0.1	0.3	0.1	0.3	0.1	0.1	0.1	0.1
Sulphate (mg/lit)	A	5.6	7.6	7.8	46.21	6.35	18.34	7.13	1.28	1.2
	B	20.3	20.56	80.34	6.66	26.25	41.21	8.55	50.42	1.2
pH	A	7.21	6.3	6.66	7.26	7.62	6.96	7	6.98	7.62
	B	7.34	6.4	6.26	6.34	6.96	7.25	6.88	6.92	7.6
Turbidity (NTU)	A	1.1	1.1	1	0.2	1	1	0.2	1	0
	B	1.2	0.6	1.5	0	0	1	1.1	0	0.1
T.D.S. (mg/lit)	A	94	180	190	149	132	110	124	164	165
	B	107	150	200	190	164	370	214	350	180

Table 3.5: Values of Hydrological parameters in the month of December at different locations

Sampling Sites		Dhankawadi	Taljai vasahat	Padmavati	Swargate	Raviwar Peth	Narayan Peth	Shaniwar Peth	Sinhgad Road	M.G. Road
Parameters										
MPN/100ml	A	0	10	4	0	2	0	0	8	0
	B	4	16	2	15	4	14	2	10	2
Hardness (mg/lit)	A	45	56	35	60	35	56	70	30	50
	B	46	55	48	200	36	240	70	35	55
Chloride (mg/lit)	A	42.54	70	42.55	53.17	46.08	28.36	53.17	31.9	49.63
	B	46.08	67.35	40	42.54	42.54	24.81	31.9	24.81	46.08
Residual Chlorine (mg/lit)	A	0.4	0.1	0.1	0.3	0.1	0.4	0.3	0.1	0.4
	B	0.2	0.1	0.1	0	0.1	0	0.2	0.1	0.2
Sulphate (mg/lit)	A	16.3	14.4	5.76	7.12	12.18	2.88	10.56	19.2	11.52
	B	17.8	14.4	5.76	7.68	21.2	2.88	11.5	5.57	21.12
pH	A	7.22	7.26	6.22	7.77	7.85	7.45	6.88	7.54	7.56
	B	7.25	7.23	6.25	7.55	7.89	7.48	6.78	7.55	7.56
Turbidity (NTU)	A	1.1	1.3	1.4	-0.2	0.2	0.8	0.2	0.5	0.2
	B	0.1	1.1	1.2	1.3	1.1	1.5	0.3	0.4	0.1
T.D.S. (mg/lit)	A	143	210	200	128	130	230	141	100	140
	B	180	180	140	180	161	250	140	140	130

Table 3.6: Values of Hydrological parameters in the month of January at different locations

Sampling Sites		Dhankawadi	Taljai vasahat	Padmavati	Swargate	Raviwar Peth	Narayan Peth	Shaniwar Peth	Sinhgad Road	M.G. Road
Parameters										
MPN/100ml	A	2	2	2	4	5	2	0	8	0
	B	4	4	0	14	2	17	4	10	2
Hardness (mg/lit)	A	45	60	55	60	70	35	24	35	50
	B	90	65	45	265	75	235	25	30	55
Chloride (mg/lit)	A	70	46.08	99.26	67.35	35.45	42.54	42.54	92.17	56.72
	B	46.08	42.54	49.63	74.44	63.81	42.55	53.17	53.17	50.21
Residual Chlorine (mg/lit)	A	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.1	0.3
	B	0.1	0	0.3	0.1	0.1	0	0.2	0.1	0.2
Sulphate (mg/lit)	A	19.2	11.52	7.68	11.52	14.4	19.2	21.12	10.56	13.45
	B	19.2	5.76	7.68	67.2	59.52	19.2	21.16	10.5	13.4
pH	A	7.78	6.88	7.62	7.43	7.99	6.53	6.88	7.78	6.78
	B	7.77	6.77	7.58	7.21	7.89	6.55	6.89	7.75	6.66
Turbidity (NTU)	A	0	1.1	0.1	1.2	0.1	0.1	0.2	0.1	0
	B	0.1	1.1	1.2	1.3	1.1	-0.2	0.2	-0.1	0.1
T.D.S. (mg/lit)	A	150	125	180	160	190	200	95	160	150
	B	200	125	115	415	200	330	106	200	125

Table 3.7: Values of Hydrological parameters in the month of February at different locations

Sampling Sites		Dhankawadi	Taljai vasahat	Padmavati	Swargate	Raviwar Peth	Narayan Peth	Shaniwar Peth	Sinhgad Road	M.G. Road
Parameters										
MPN/100ml	A	0	9	0	2	2	2	6	8	0
	B	0	10	0	8	4	14	4	12	2
Hardness (mg/lit)	A	70	35	35	60	55	60	35	70	55
	B	75	35	45	240	50	138	45	75	60
Chloride (mg/lit)	A	35.45	42.54	92.17	56.72	21.27	46.08	49.63	28.36	31.9
	B	63.81	53.17	53.17	99.26	138.25	42.54	49.63	24.81	28.36
Residual Chlorine (mg/lit)	A	0.3	0.1	0.3	0.2	0.1	0.1	0.2	0.2	0.1
	B	0.2	0.1	0.3	0.1	0.1	0	0.1	0.1	0.1
Sulphate (mg/lit)	A	10.55	8.44	4.8	5.77	25.8	35.23	13.44	79.9	13.45
	B	10.59	8.64	4.67	5.76	23.56	35.55	10.45	35.23	13.4
Ph	A	7.18	7.23	6.55	7.45	6.55	6.34	7.05	7.56	6.56
	B	7.23	7.11	6.56	7.34	6.34	6.45	7.02	7.77	6.59
Turbidity (NTU)	A	1.1	1.2	1.2	1.3	0.1	1.4	1.2	0.1	1.1
	B	0.1	1.1	1.2	1.3	0.1	1.8	1.2	0.1	1.1
T.D.S. (mg/lit)	A	264	186	230	385	356	307	188	400	250
	B	357	320	207	500	420	376	300	390	200

Table 4.1: Monthly variations in *MPN*/100 ml

Sampling sites		Dhankawadi	Taljai vasahat	Padmavati	Swargate	Raviwar Peth	Narayan Peth	Shaniwar Peth	Sinhgad Road	M.G. Road
Months										
August	A	2	8	2	0	2	0	2	12	0
	B	2	10	0	5	0	11	0	14	2
September	A	2	10	2	0	8	0	0	8	0
	B	2	12	2	4	10	2	0	15	0
October	A	0	14	0	0	4	0	0	11	0
	B	0	7	10	5	5	8	0	17	2
November	A	2	10	0	0	0	2	0	10	0
	B	2	12	0	14	0	9	4	14	2
December	A	0	10	4	0	2	0	0	8	0
	B	4	16	2	15	4	14	2	10	2
January	A	2	2	2	4	5	2	0	8	0
	B	4	8	0	14	2	17	4	10	2
February	A	0	9	0	2	2	2	6	8	0
	B	4	10	0	8	4	14	4	12	2

Table 4.2: Monthly variations in *Hardness* (mg/lit)

Sampling sites		Dhankawadi	Taljai vasahat	Padmavati	Swargate	Raviwar Peth	Narayan Peth	Shaniwar Peth	Sinhgad Road	M.G. Road
Months										
August	A	50	55	45	50	75	145	55	65	70
	B	50	60	60	250	65	85	75	90	80
September	A	50	54	52	70	90	87	55	71	67
	B	55	67	62	254	68	90	72	91	77
October	A	55	60	60	75	70	65	55	60	65
	B	60	70	60	250	70	205	75	80	70
November	A	50	55	57	72	87	62	65	65	60
	B	55	68	65	200	90	200	75	90	65
December	A	45	56	35	60	35	56	70	30	50
	B	46	55	48	200	36	240	70	35	55
January	A	45	60	55	60	70	35	24	35	50
	B	90	65	45	65	75	35	25	30	55
February	A	70	35	35	60	55	60	35	70	55
	B	75	35	45	240	50	138	45	75	60

Table 4.3: Monthly variations in *Chloride* (mg/lit)

Sampling sites		Dhankawadi	Taljai vasahat	Padmavati	Swargate	Raviwar Peth	Narayan Peth	Shaniwar Peth	Sinhgad Road	M.G. Road
Months										
August	A	31.9	28.36	21.27	35.45	21.27	53.17	81.53	109.89	49.63
	B	24.81	24.81	24.81	131.9	138.25	177.25	202.06	223.33	46.08
September	A	32.21	30.19	32	28	21.27	30.15	40.39	90.27	52.22
	B	23.68	28.94	28.41	25.4	160.2	55.66	177.6	198.4	46.58
October	A	28.46	42.54	42.54	31.9	22.27	28.36	38.99	81.89	46.08
	B	24.81	53.17	53.17	31.9	130.24	46.08	42.54	123.3	49.16
November	A	30.2	30.32	42.11	23.63	30.51	20.66	28.64	90.21	40.66
	B	23.66	27	30.84	30.9	40.61	125.32	40.33	210	46.35
December	A	42.54	70	42.55	53.17	46.08	28.26	53.17	31.9	49.63
	B	46.08	67.35	40	42.54	42.54	24.81	31.9	24.81	46.08
January	A	70	46.08	99.26	67.35	35.45	42.54	42.54	92.17	56.62
	B	46.08	42.54	49.63	74.44	63.81	42.55	53.17	53.17	50.21
February	A	35.45	42.54	90.17	56.72	21.27	46.08	49.63	28.36	31.9
	B	63.81	53.17	53.17	99.26	138.25	42.54	49.63	24.81	28.36

Table 4.4: Monthly variations in *Sulphate* (mg/lit)

Sampling sites		Dhankawadi	Taljai vasahat	Padmavati	Swargate	Raviwar Peth	Narayan Peth	Shaniwar Peth	Sinhgad Road	M.G. Road
Months										
August	A	14.14	36.42	7.71	6.42	25.71	16.71	7.71	1.28	1.28
	B	34.72	11.57	7.71	90.01	38.57	90.01	18	90.01	1.28
September	A	7.45	8.65	5.01	6.45	20.15	14.78	5.32	2.64	1.55
	B	30.25	10.48	88.14	68.21	8.5	39.21	15.21	88.59	1.25
October	A	15.14	27.04	45.07	56.58	20.61	15.43	37.29	2.2	1.28
	B	30.72	7.71	54.09	55.07	35.58	32.14	38.57	80.15	1.45
November	A	5.6	7.6	7.8	46.21	6.35	18.34	7.13	1.28	1.2
	B	20.3	10.56	80.34	6.66	26.25	41.21	8.55	50.52	1.2
December	A	16.3	14.4	5.76	7.12	12.18	2.88	10.56	19.2	11.52
	B	17.8	14.4	5.76	7.68	21.2	2.88	11.5	5.57	21.12
January	A	19.2	11.52	7.68	11.52	14.4	19.2	21.12	10.56	13.55
	B	19.2	5.56	7.68	67.2	59.52	19.2	21.16	10.5	13.4
February	A	10.55	8.44	4.8	5.77	25.8	35.23	13.44	79.9	13.45
	B	10.59	8.64	4.67	5.73	23.56	35.55	10.45	35.23	13.4

Table 4.5: Monthly variations in P^H

Sampling sites		Dhankawadi	Taljai vasahat	Padmavati	Swargate	Raviwar Peth	Narayan Peth	Shaniwar Peth	Sinhgad Road	M.G. Road
Months										
August	A	7.18	6.78	6.57	6.69	7.06	7.11	6.97	6.92	7.29
	B	7.12	6.71	6.67	7.4	6.53	7.24	6.86	7.48	7.29
September	A	7.19	6.25	7.25	6.59	7.56	6.95	7.05	6.32	7.46
	B	6.24	6.71	6.68	7.49	6.89	7.25	6.35	6.31	7.12
October	A	7.12	7.27	7.25	7.3	7.07	7.12	7.46	6.97	7.07
	B	7.18	7.23	7.51	7.35	7.1	7.35	7.43	7.48	7.24
November	A	7.21	6.3	6.66	7.26	7.62	6.96	7	6.98	7.62
	B	7.34	6.4	6.26	6.34	6.96	7.25	6.88	6.92	7.6
December	A	7.22	7.26	6.22	7.77	7.85	7.45	6.88	7.54	7.56
	B	7.25	7.23	6.25	7.55	7.89	7.48	6.78	7.55	7.56
January	A	7.78	7.88	7.62	7.43	7.99	6.53	6.88	7.78	6.78
	B	7.77	6.77	7.58	7.21	7.89	6.65	6.89	7.75	6.66
February	A	7.18	7.23	6.55	7.55	6.55	6.34	7.05	7.56	6.56
	B	7.23	7.11	6.56	7.34	6.34	6.45	7.02	7.77	6.59

Table 4.6: Monthly variations in *TDS* (mg/lit)

Sampling sites		Dhankawadi	Taljai vasahat	Padmavati	Swargate	Raviwar Peth	Narayan Peth	Shaniwar Peth	Sinhgad Road	M.G. Road
Months										
August	A	106.52	180	100	250	180	200	195	183.19	180
	B	116	140	210	400	248	490	302.35	410	135
September	A	100	165	97.56	245	185	189	143	170	186
	B	116	154	198	335	244	300	272	384	133
October	A	107	260	300	260	140	260	150	152	140
	B	124	138	190	345	244	290	200	290	170
November	A	94	180	190	149	132	110	124	164	165
	B	107	150	200	190	164	370	214	350	180
December	A	143	210	200	128	130	230	141	100	140
	B	180	180	140	180	161	250	140	140	130
January	A	150	125	180	160	190	200	95	160	150
	B	200	125	115	415	200	330	106	200	125
February	A	264	186	230	385	356	307	188	400	250
	B	357	320	207	500	420	376	300	390	200

Table 4.7: Average variation in parameters

Sampling Sites	Dhankawadi		Taljai vasahat		Padmavati		Swargate		Raviwar Peth		Narayan Peth		Shaniwar Peth		Sinhgad Road		M.G. Road	
Parameter	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
MPN/ 100ml	1.14	2.57	9	10.71	1.43	2	0.86	9.29	3.29	3.57	0.86	10.71	1.14	2	9.29	13.14	0	1.71
Hardness (mg/lit)	52.14	61.57	53.57	60	48.43	55	63.86	190.28	68.86	64.86	72.86	179	51.29	62.43	56.57	70.14	59.57	66
Chloride (mg/lit)	38.68	36.13	41.43	42.43	52.84	40	42.32	62.33	28.3	101.99	35.6	73.46	47.84	85.32	74.96	122.55	46.68	44.69
Sulphate (mg/lit)	12.63	23.37	16.3	9.85	11.98	35.48	20.01	42.94	17.89	30.45	26.69	37.17	19	17.63	16.72	57.99	6.26	7.59
pH	7.27	9.22	8.91	6.88	6.87	6.79	7.23	7.24	7.39	7.09	6.92	7.1	7.04	6.89	7.15	9.32	7.19	7.15
TDS (mg/lit)	137.78	171.42	186.57	172.42	185.36	180	225.28	337.85	187.57	240.14	213.71	343.71	148	219.19	189.88	309.14	173	153.28

RESULT & DISCUSSION

Monthly percentage of contaminated samples:

(A) In the month of August the percentage of contamination was found to be 11.11% and maximum contamination was found at Sinhgad Road.

(B) In the month of August the percentage of contamination was found to be 22.22% and maximum contamination was found at Sinhgad Road and Narayan Peth.

(A) In the month of September the percentage of contamination was found to be 00%.

(B) In the month of September the percentage of contamination was found to be 22.22% and maximum contamination was found at Sinhgad Road and Taljai Vasahat.

(A) In the month of October the percentage of contamination was found to be 22.22% and maximum contamination was found at Sinhgad Road and Taljai Vasahat.

(B) In the month of October the percentage of contamination was found to be 11.11% and maximum contamination was found at Sinhgad Road.

(A) In the month of November the percentage of contamination was found to be 00%.

(B)In the month of November the percentage of contamination was found to be 33.33% and maximum contamination was found at Sinhgad Road Swargate and Taljai Vasahat.

(A) In the month of December the percentage of contamination was found to be 00%.

(B) In the month of December the percentage of contamination was found to be 33.33% and maximum contamination was found at Narayan Peth, Swargate and Taljai Vasahat.

(A) In the month of January the percentage of contamination was found to be 00%.

(B) In the month of January the percentage of contamination was found to be 22.22% and maximum contamination was found at Narayan Peth and Swargate.

(A) In the month of February the percentage of contamination was found to be 00%.

(B) In the month of February the percentage of contamination was found to be 22.22% and maximum contamination was found at Sinhgad Road and Narayan Peth.

Average percentage of contamination:

(A)The Average percentage of contamination found in drinking water is 4.76% less as compared to overhear tank (B) which is found to be 23.80%

Average values of parameters:

(A) The MPN average value ranges from 00-10.71

It is maximum at Sinhgad road and minimum at M. G. road.

(B) The MPN average value ranges from 1.71-13.71

It is maximum at Sinhgad road and minimum at M. G. road.

(A) The Hardness average values ranges from 48.43 – 72.86 mg/l.

It is maximum at Narayan Peth & minimum at Padmavati.

(B) The Hardness average values ranges from 55 – 208.43 mg/l.

It is maximum at Swargate & minimum at Padmavati.

(A) The Chloride average values ranges from 28.3 – 74.96 mg/l.

It is maximum at Sinhgad road & minimum at Raviwar Peth.

(B) The Chloride average values ranges from 36.13 – 122.55 mg/l.

It is maximum at Sinhgad road & minimum at Dhankawadi.

(A) The Sulphate average values ranges from 6.26 – 26.69 mg/l.

It is maximum at Narayan Peth & minimum at M.G.road.

(B) The Sulphate average values ranges from 7.59 – 57.99 mg/l.

It is maximum at Sinhgad road & minimum at M.G.road.

(A) The PH average value ranges from 6.87 – 8.91.

It is maximum at Taljai vasahat & minimum at Padmavati.

(B) The PH average value ranges from 6.79 – 7.32.

It is maximum at Sinhgad road & minimum at Padmavati.

(A) The TDS average values ranges from 137.78 – 225.28mg/l.

It is maximum at Swargate & minimum at Dhankawadi.

(B) The TDS average values ranges from 153.28 – 343.71mg/l.

It is maximum at Narayan Peth & minimum at M.G. road.

Data analysis of water and health survey sheets suggests the lack of awareness regarding the proper maintenance of the storage system that is whether it household storage or overhead tank storage. The percentage of contamination was more in overhead tank that is 23.80% as compared to drinking water, which is found to be 4.76%.

Wegot very low residual chlorine in the above said contaminated storage tank (near about 0.1ppm). While in some cases where there is properly maintained overhead storage and households, we got absolutely no contamination. The MPN count in such cases most of the times is 0 and residual chlorine was becomes 0.3 to 0.35 ppm (Dhankawadi, M.G. Road, Shaniwar Peth). In some cases it was also observed that the water in overhead storage tank is potable but in domestic household storage water was not potable. The reasons for above are as follows (Narayan Peth and Swargate).In slum areas (Taljai Vasahat and Sinhgad) the improper maintenance of household storage is coupled with unhygienic habits makes the water non-potable.The result of contamination is secondly confirmed by the levels of water borne diseases found in project sites that is Sinhgad and Taljai Vasahat where maximum of water bornediseases are observed. Similarly in addition to water borne diseases like diarrhea (water wash disease) and dysentery were also found in Taljai Vasahat.

CONCLUSION

- As compared to the household storage overhead tank storage is more contaminated. The contamination was due to the MPN.
- Improper way of maintenance of storage systems lead to contamination.

- An unclean habit in slum areas was the major reason in addition to that improper way of storing the water for observed contamination.
- Lack of awareness of among the people help to increase the contamination.
- The water borne diseases is mainly observed in Taljai vasahat and Sinhgad road.
- All though the contamination is low, but the population that faces the water borne disease is noticeable which may affect the efficiency of water.
- Water scarcity may create tension on the water quality status.
- Water losses due to running taps in house are also noticeable.
- Leakage in pipelines and at the water storage tank was the major cause of water loss.
- Also in many houses the water stored on the previous day is discarded on the next day in demand of fresh water.

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