Research Paper

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Bacteriological and Physicochemical Assessment of Potable Water Samples from Taluka Telhara Dist.-Akola

Microbiology

KEYWORDS : Drinking water sample, MPN count, H2S Strip field test, Chemical test.

Pankaj A Matre — P G Department Of Microbiology, Shri Shivaji College of Arts, Commerce & Science, Akola 444001 (M.S.) India

S. N. Zodpe. — P G Department Of Microbiology, Shri Shivaji College of Arts, Commerce & Science, Akola 444001 (M.S.) India

ABSTRACT

A total 100 water samples were collected aseptically in a sterilized container from different water sources from various locations. The different test such as Ortho-Toludiene test, H2S Strip field test and MPN test was done to detect the presence of Coliforms in drinking water. The results revealed that most of water sample collected from P.H.C of Akola district shows high MPN and so was found to be non-potable. Whereas the source which is chlorinated was found to be potable. Further the physicochemical analysis was also carried out to study the different parameter. Such as colour, odour, pH, TDS, Turbidity, Hardness, pH, Alkalanity, irons, fluorides and nitrate by adapting the standard method. From the complete study the results revealed that out of 50 only 24 samples were found to be potable for drinking purposes, so further processing of water sources is needed to avoid of to overcome the difficulties related to health hazards and water borne diseases.

INTRODUCTION :-

Water is a universal solvent and it is major constituent of all organisms. Due to the rapid Urbanization, Industrialization as well as Agricultural activities have made environmental pollution a growing concern globally. All the receptors system exposed the contaminants ground water was pristine. With the increasing population and industrialization used a very fast expansion of drinking water problems has gained at most significance. Supply of drinking water through the pipe distribution system is done by all municipal authority. But it has been falling short of increasing demand by ever expanding metropolis. The water supply is supplemented by shallow well, deep well or bore well. Today most of the rivers of world received millions of sewage, domestic sewage, industrial and agricultural effluents. Regular drinking water monitoring not only prevents diseases and hazards but also checks the water resources from being further polluted.

Ground water pollution is only physical or chemical change in water that can adversely affect organism. (Trivedi P. R. and Raj G. 1992) because under natural conditions water trends to distribute and deposits its pollutants across the surface of the earth but where the contamination become extensive, water is no longer able to disperse the contaminants. Ground water was found to be contaminated due to improper construction, shallowness, animal west, proximity to toilet facilities, refuse damp site and various human activities around the well. The most important source of drinking water for about 70% of Indian population is ground water and is considered less polluted. But lack of sanitation, improper waste disposal, faulty well construction and the water source protection increase ground water and surface water contamination and 40% or more of the disease out breaks were attributed to polluted ground water consumption (Narain Rai, et al., 1995).

The principle risk associated with water in small community supplies is that of infectious disease related to faecal contamination hence, the Microbiological examinations of drinking-water emphasize assessment of the hygienic quality of the supply. This requires the isolation and enumeration of organisms that indicate the presence of faecal contamination. In certain circumstances, the indicator organisms may also be used to assess the efficiency of drinking water treatment plants, which is an important element of quality control. Other Microbiological indicators, not necessarily associated with faecal pollution, may also be used for this purpose. The isolation of specific pathogens in water should be undertaken only by reference laboratories for purpose of investigating and controlling outbreaks of disease. (Ballester, F, Sunyer, J 2000).

Potable water is the water of sufficient high quality that can be consumed or used with low risk of immediate or long harm. Water has always been an important and life-sustaining drink to humans and is essential to the survival of all organisms. Also the many infectious diseases are transmitted by water through faecal-oral route (WHO, 2004). General water quality indicator is used to indicate the possible presence of other harmful contaminants like Coliforms. The Coliform groups belong to the Enterobacteriaceae family. A positive test result may be a faecal Coliform or E.coli bacteria test if, present confirm that sewage or animal waste is contaminating the water. The pH value is considered a general quality indicator which along with total dissolved solids (TDS), should not change appreciably over time. The test for Nitrate provide a good routine analysis for rural water supply unless is a reasons to suspect other contaminants. (Guideline Manual for Drinking Water Quality Monitoring, 2012).

Instead of arranging the seminars and workshops on Save Water, if we proceed ahead towards maintaining the water quality & help to preserve the nature resources it will found to be one of the important step towards making the pollution free water .So by considering the need of water treatment the present investigation was carried out on analysis of drinking water of Telhara Taluka, Dist. Akola.

MATERIAL AND METHODS :-

Water samples were collected from different sources such as Tap water, Bore well, Hand pump, Tube well also Open well. But in case of Chemical analysis samples were collected from Hand pump, Bore well, Open well &Tube well.

Sampling:-

The collection of samples for bacteriological examination is necessary to ensure that the sample is representative of water under examination and to avoid accidental contamination of the sample during collection.

a) Sampling bottles-Sterilized glass bottles with stopper or screw cap.
b) In case of chemical analysis, the clear & clean bottles with screw cap were use.

Method of water sample collection:-

- Hold the sample bottle at the bottom by one hand, the glass topper or screw cap ensuring no touch to the rim portion of bottle.
- Collect the water directly from the source into bottle by proper procedure and do not keep the bottle open to avoid dust particles entering in.
- The sample bottle was not opened till the time of filling and protected from contamination.

Samples were collected from different following sources.
a) Sampling from Taps and Bore well:-

The tap was opened fully and the water allowed to run to waste for 2-3minutes, then sample was collected in sterilized sampling bottle, with care and the sample procedure was done for bore well.

b) Sampling from Hand pumps and Tube well:-
Operate the pump to flush out stagnant water in the pipe, allow to flowing the fresh water for five minutes then collect water sample directly into the bottle.

c) Sampling from open well:-
Do not use buckets, utensils available on the site, use nylon or absorbent thread &immerse into water at 15-30 cm depth.

But, in case of sampling of chemical analysis we can be use some utensils during collections.

Prevention and Storage of Samples:-
The Bacteriological examination of water sample were initiated immediately after collection, preferable within one hour, the time elapsing between collection not exceed 24 hrs .If it is not possible then the sample were stored and transported to the laboratory and stored at a temperature between 4°C to 10°C to prevent the death or multiplication of bacteria during transport .

Test for Bacteriological analysis:-
1) O.T Test (Ortho Toludine test):-
Water sample is treated or Chlorinated is checked by this test.

In the 10ml of water sample add few drops (0.5ml) Ortho-Toludine Reagent, if yellow colour is appear then test found to be positive, otherwise negative.

2) H_2S Strip Field Test:-
Presence of Coliforms in drinking water is consistently associated with organisms that produce Hydrogen Sulphide (H_2S). Such as Salmonella, Proteus, Citrobacter & some strains of Klebsiella etc.

Add 10ml of water sample under test to already prepared media bottle. Incubate the inoculated bottle at 37 °C for 24 hours; observe the result after 24 hours. In case of negative result (No blackening of media), the incubation period shall be extended up to 48 hours for final observation.

3) Coliform Test for Bacteria:-
Characterized by their ability to ferment Lactose into acid and gas at 37°C within 48 hours. These include E.coli, Enterobacter, and Klebsiella spp. As these organisms are not only derived from faeces but also from vegetation and soil.

Inoculate 50ml portion of water sample into 50ml double strength MacConkey's broth and five 10ml portion of water into each of the five 10ml double strength MacConkey's broth then incubate at 37°C for 48 hours. Record the number of tubes showing positive reaction for production of acid and gas.

Compute the MPN count of coliform bacteria per 100 ml of sample from the MPN table.

Physicochemical Analytical Test: - (BIS – Bureau of Indian Standards, 2012)

- Physical appearance: - Colour or colourless.
- Odour: - Odourless or any characteristic odour by smelling.
- Turbidity: - Nephelometric method.
- pH: - pH meter.
- T.D.S (Total Dissolved Solid):- T.D.S/Conductivity meter.
- Hardness (Total hardness):- EDTA-titrometric method.
- Alkalinity :- Titrometric method
- Iron (Fe):- Spectrophotometer screening method/Colorimetric method.
- Nitrates: - Spectrophotometer screening method.
- Fluoride: - Spectrophotometer screening method (SPADNS method.

Table 1: MPN / 100 ml [McCardy's Table]

No. of Tubes giving positive reactions out of		MPN Count
1 of 50 ml	5 of 10 ml	
0	1	1
0	2	2
0	3	4
0	4	5
1	0	2
1	1	3
1	2	6
1	3	9
1	4	16
1	5	More than 16

Observation Table :-

S. No.	Sample location	Source	O.T test	H_2S Strip field test	MPN test			Result
					No. of bottle	No. Test tube	MPN count	
	A) Rural hospital Telhara [Telhara]							
1)	Near Shivaji chouk	Local tap water	+ve	-ve	00	00	00	Potable
2)	Hiverkhed road	Local tap water	+ve	-ve	00	00	00	Potable
3)	Near Gaykwad shop	Local tap water	+ve	-ve	00	00	00	Potable
4)	Near Dr.Ambedkar hall	Local tap water	+ve	-ve	00	00	00	Potable
5)	Near Sant Ravidas temple	Local tap water	+ve	-ve	00	00	00	Potable
6)	Near Gajanan nager	Local tap water	+ve	-ve	00	00	00	Potable
7)	Near Hanuman temple	Local tap water	+ve	-ve	00	00	00	Potable
8)	Bhim nager	Local tap water	+ve	-ve	00	00	00	Potable
9)	Near Mankar nager	Local tap water	+ve	-ve	00	00	00	Potable
B) P.H.C. Panchagvan								
10)	[Manabda]	Hand pump	-ve	-ve	00	00	00	Potable
11)	[Nimboli]	Hand pump	-ve	+ve	1	4	16	Non-potable
12)	[Dapura]	Hand pump	-ve	+ve	1	2	6	Non-potable
13)	Near Durga Mata temple [Dapura]	Bore well	-ve	-ve	00	00	00	Potable
14)	[Manabda]	Hand pump	-ve	-ve	00	00	00	Potable

S. No.	Sample location	Source	O.T test	H_2S Strip field test	MPN test			Result
					No. of bottle	No. Test tube	MPN count	
15)	Near Gram panchayat [Khap-erkheda]	Tap water	+ve	-ve	00	00	00	Potable
16)	Near Z.P.School [Nimboli]	Hand pump	-ve	+ve	00	5	5	Non-potable
17)	Near Mahadevas temple [Bhamberi]	Tap water	-ve	+ve	1	5	More than 16	Non-potable
18)	[Bhamberi]	Tap water	-ve	-ve	00	00	00	Potable
19)	Near Keshav nager[Bhamberi]	Tap water	-ve	-ve	00	00	00	Potable
20)	Near Water tank [Umari]	Bore well	-ve	+ve	1	4	16	Non-potable
21)	Near Bus stand [Manatri]	Bore well	-ve	-ve	1	2	6	Non-potable
C) P.H.C.Adgaon								
22)	[Chunar-pura]	Tap water	-ve	-ve	00	00	00	Potable
23)	Near Water tank [Sirsoli]	Tap water	-ve	+ve	1	3	9	Non-potable
24)	Near Dutta temple [Sirsoli]	Bore well	-ve	-ve	00	00	00	Potable
25)	Near River [Shiv nager]	Hand pump	-ve	+ve	1	4	16	Non-potable
26)	[Patherdi]	Tap water	-ve	+ve	1	5	More than 16	Non potable
27)	[Sirsoli]	Hand pump	-ve	+ve	1	5	More than 16	Non-potable
28)	Near Z.P. School [Bhili]	Hand pump	-ve	+ve	1	5	More than 16	Non-potable
29)	[Dhonda-akhar]	Hand pump	-ve	+ve	1	2	6	Non-potable
30)	Near River [Borva]	Well	+ve	-ve	00	00	00	Potable
31)	In Z.P.School [Khandala]	Tap-water	-ve	+ve	1	3	9	Non-potable
32)	Sub-center [Malthana]	Bore well	-ve	+ve	1	3	9	Non-potable
33)	[Sadarpur]	Bore well	-ve	+ve	1	1	3	Non potable
34)	[Patherdi]	Tap water	-ve	-ve	00	00	00	Potable
D) P.H.C.Hiverkhed								
35)	Near Ambedkar statue [Belkhed]	Tap water	-ve	+ve	00	4	5	Non potable
36)	Near Gram panchayat [Belkhed]	Tap water	-ve	+ve	1	2	6	Non potable
37)	Near Ayurvedic hospital [Belkhed]	Tap water	-ve	+ve	1	1	3	Non-potable
38)	Infront of Sub-center [Hingni bu]	Hand pump	-ve	-ve	00	00	00	Potable
39)	Near Maddjit [Belkhed]	Tap water	-ve	+ve	1	5	More than 16	Non-potable
40)	Near Bus stand [Talegaon bu]	Hand pump	-ve	+ve	1	3	9	Non-potable
41)	[Talegaon bu]	Hand pump	-ve	-ve	00	00	00	Potable
42)	Near Teli -pura [Talegaon bu]	Hand pump	-ve	-ve	00	00	00	Potable
43)	Near Water tank [Hiverkhed]	Hand pump	-ve	+ve	1	5	More than 16	Non potable
E) P.H.C.Danapur								
44)	Near Champa mata temple [Male-gaon]	Local tap water	-ve	-ve	00	00	00	Potable
45)	Infront of Buddh vihar [Sari-vadner]	Tap water	-ve	+ve	1	4	16	Non potable
46)	[Saundala]	Tap water	-ve	-ve	00	00	00	Potable
47)	Near Montasary school [Zari-bazar]	Hand pump	-ve	-ve	00	00	00	Potable
48)	Rathi- pura [Chandanpur]	Well	+ve	-ve	00	00	00	Potable
49)	Near Samaj mandir [Karla]	Local tap water	+ve	-ve	00	00	00	Potable
50)	Near Ambikadevi high school [Saundala]	Water tank	+ve	-ve	00	00	00	Potable

Physicochemical Analysis of Water samples.

Sr no.	Village Name	Source (Type)	Location (Area)	Appearance (Colour)	Odour (Smell)	Turbidity (In N.T.U.)	pH	T.D.S.	Hardness (as $CaCO_3$)	Alkalinity (as $CaCO_3$)	Iron (as Fe)	Nitrate (as NO_3)	Fluoride (as F)
1	Danapur	Tube well	D1	Colourless	Odourless	2.1	7.9	650	368	368	0.112	85.49	0.272
2	Danapur	Tube well	D2	Colourless	Odourless	2.4	8.1	452	232	320	0.234	38.51	0.368
3	Danapur	Tube well	D3	Colourless	Odourless	3.0	8.2	402	320	240	0.223	11.25	0.843
4	Danapur	Tube well	D4	Colourless	Odourless	2.4	8.1	490	240	360	Nil	44.07	0.521
5	Danapur	Tube well	D5	Colourless	Odourless	3.1	8.0	522	380	288	0.217	54.71	0.260
6	Danapur	Tube well	D6	Colourless	Odourless	3.1	8.1	482	348	372	0.251	20.31	0.458
7	Danapur	Hand pump	D7	Colourless	Odourless	2.2	8.2	384	300	300	0.112	08.68	0.198
8	Danapur	Hand pump	D8	Colourless	Odourless	4.1	8.2	462	400	328	0.089	17.29	0.396
9	Danapur	Hand pump	D9	Colourless	Odourless	2.3	8.1	540	420	300	0.084	40.53	0.419
10	Danapur	Hand pump	D10	Colourless	Odourless	3.2	8.0	532	428	320	0.295	40.09	0.549
11	Danapur	Hand pump	D11	Colourless	Odourless	3.3	7.6	440	368	380	0.267	16.61	0.923
12	Danapur	Hand pump	D12	Colourless	Odourless	3.2	8.0	472	392	340	0.123	19.43	0.589
13	Danapur	Hand pump	D13	Colourless	Odourless	3.5	8.1	490	408	420	0.028	17.60	0.713
14	Danapur	Hand pump	D14	Colourless	Odourless	3.5	7.8	652	460	432	0.173	88.31	1.025
15	Danapur	Hand pump	D15	Colourless	Odourless	3.6	7.9	1540	920	400	0.178	61.13	0.860
16	Danapur	Hand pump	D16	Colourless	Odourless	2.5	8.1	702	440	392	0.834	120.70	1.206
17	Danapur	Hand pump	D17	Colourless	Odourless	3.1	8.1	612	420	360	0.134	73.98	0.436
18	Danapur	Hand pump	D18	Colourless	Odourless	2.4	8.0	555	440	380	0.240	19.27	0.458
19	Danapur	Hand pump	D19	Colourless	Odourless	2.6	8.1	652	408	320	0.234	109.42	0.221
20	Belkhed	Hand pump	B1	Colourless	Odourless	2.1	8.0	870	600	400	0.195	119.38	0.453
21	Belkhed	Hand pump	B2	Colourless	Odourless	2.1	7.5	940	640	440	0.406	147.26	1.036
22	Belkhed	Hand pump	B3	Colourless	Odourless	4.1	7.8	1112	760	420	0.251	98.78	1.291
23	Belkhed	Hand pump	B4	Colourless	Odourless	2.2	7.8	1280	800	440	0.501	262.21	0.968
24	Belkhed	Bore well	B5	Colourless	Odourless	2.1	8.0	553	420	432	0.251	33.00	0.366
25	Belkhed	Bore well	B6	Colourless	Odourless	2.2	7.7	976	640	460	0.167	119.61	0.415
26	Belkhed	Bore well	B7	Colourless	Odourless	3.1	7.8	730	420	600	0.245	28.75	0.764
27	Belkhed	Bore well	B8	Colourless	Odourless	1.2	7.7	563	432	440	0.212	25.02	0.702
28	Belkhed	Bore well	B9	Colourless	Odourless	1.6	7.7	570	440	448	0.212	26.35	1.438
29	Ranegao-n	Bore well	R1	Colourless	Odourless	3.3	7.7	720	420	280	0.217	35.12	0.832
30	Ranegao-n	Hand pump	R2	Colourless	Odourless	3.1	7.6	835	440	248	0.306	33.71	1.008
31	Ranegao-n	Hand pump	R3	Colourless	Odourless	2.6	7.7	736	520	568	0.256	17.94	0.860
32	Ranegao-n	Hand pump	R4	Colourless	Odourless	2.9	7.7	714	480	600	0.240	11.42	0.181
33	Changal-wadi	Bore well	C1	Colourless	Odourless	2.8	7.9	540	420	360	0.201	22.81	0.526
34	Changal-wadi	Hand pump	C2	Colourless	Odourless	3.1	7.9	680	440	380	0.807	76.41	0.951
35	Changal-wadi	Hand pump	C3	Colourless	Odourless	2.1	7.9	710	500	408	0.262	74.20	0.674
36	Changal-wadi	Hand pump	C4	Colourless	Odourless	1.4	8.0	571	420	360	0.089	42.97	0.883
37	Changal-wadi	Hand pump	C5	Colourless	Odourless	2.2	8.1	452	360	380	0.195	06.99	1.008
38	Changal-wadi	Hand pump	C6	Colourless	Odourless	2.5	8.1	560	420	400	0.223	19.44	0.877
39	Patherdi	Hand pump	P1	Colourless	Odourless	3.5	8.1	1390	680	944	0.067	114.60	0.730
40	Patherdi	Hand pump	P2	Colourless	Odourless	3.2	7.8	1740	800	720	0.045	124.85	0.413
41	Patherdi	Hand pump	P3	Colourless	Odourless	3.6	7.9	1840	1000	760	0.117	110.96	0.628
42	Patherdi	Hand pump	P4	Colourless	Odourless	3.8	7.9	1940	760	620	0.084	179.25	0.538
43	Patherdi	Hand pump	P5	Colourless	Odourless	4.1	7.9	2100	640	700	2.085	224.58	0.566
44	Khel-Deshpande	Tube well	Kh1	Colourless	Odourless	3.2	8.0	1730	440	660	0.067	94.76	1.070
45	Khel-Deshpande	Hand pump	Kh2	Colourless	Odourless	2.9	8.2	827	144	640	2.380	11.11	1.189
46	Khel-Deshpande	Hand pump	Kh3	Muddy	Odourless	5.1	7.9	2480	584	500	0.128	226.53	0.957
47	Khel-Deshpande	Tube well	Kh4	Colourless	Odourless	3.1	8.1	912	184	640	0.868	22.20	1.246
48	Khel-Deshpande	Hand pump	Kh5	Muddy	Odourless	6.1	8.0	4005	728	700	0.123	147.61	1.161
49	Khel-Deshpande	Hand pump	Kh6	Colourless	Odourless	3.6	7.8	2270	56	1000	0.056	06.69	1.342
50	Khel-Deshpande	Hand pump	Kh7	Colourless	Odourless	2.8	7.6	640	440	500	0.180	14.42	0.810

RESULT AND DISCUSSION :-

Much of the ill health which affects humanity, especially in countries can be treated to lack of safe and whole water supply. There can be no state of positive health and well being without safe water. Since water is vital for our life we expect it to be clean and safe. Even that appears clear may not necessarily be safe acceptable. The water intend for human consumption must be free of pathogenic and chemical agents, pleasant and usable for domestic purposes since water is the most important potential source of infectious diseases. So water purification is the most important potential available for insuring public health.

During the investigation a total of 50 different water samples were collected from various locations of Telhara Taluka. The results of bacteriological analysis of the water sample are presented in Table. Mainly the water samples were collected from Primary Health Center (PHC). The sources for collection was Hand pump, Bore well, Tap water and well etc. The different test i.e. Most Probable Number (MPN), H_2S Strip field test &O.T. (Ortho-Toludiene) test were done to check the potability of water. The water sample from rural Hospital Telhara was chlorinated &hence shows all the test result negative and hence consider that the water is potable. The other water samples from P.H.C. Adgaon, Hiverkhed, Danapur, shows presence of coliform organisms, the coliform organisms refers to Gram negative, rod shaped bacteria. Coliform bacteria were regarded as belonging to the genera Escherchiae, Citrobactor, Enterobactor and Klebsiella. These groups of organisms were considered as the faecal contaminant of water pollutions.

The most probable number (MPN) for total coliform count of the water sample range from 1 to more than 16 MPN per 100ml. In this study MPN of coliform in case of water sample collected from Nimoboli and Umari under P.H.C. Panchgavan shows MPN more than 16 and hence water is highly contaminated with faecal matter and hence not utilized for potable purpose. The location under P.H.C. Adgaon i.e. Patherdi, Sirsoli and Bhili shows higher coliform count and hence the water is non-consumable. Most of the water sample from P.H.C. Hiverkhed shows higher MPN count and hence that water is not safe for drinking purposes.

Most surprising result is obtained from the location under P.H.C Danapur shows 0(zero) MPN count and water is considered as safe to use for drinking purposes. Similarly the O.T. test and H_2S strip field test was found to be negative indicating that the water sources supplies water to community for drinking purposes are not chlorinated and hence there is need to treat the water plant urgently otherwise it may lead to water born diseases and other related health hazards to the people. The consumption of drinking water contaminated with pathogenic microbes of faecal origin is of significant risk for human health.

During investigation the study proceed further for the physicochemical analysis of water samples. The main physical & chemical parameters of drinking water samples including Colour, Odour, pH, T.D.S, Turbidity, Hardness, Alkalinity, Irons, Fluorides, Nitrates.

The pH value is also considered as a general water indicator. The water sample collected is having pH range in between 7.6 to 8.2, pH value lower than 4 will produce sour taste and higher value above pH 8.5 provide bitter test to water. The different water samples collected are colourless and odourless where as, some of the samples was found to be turbid. The turbidity in water sample is due to the presence of particular matter such as clay or slit, finely divided organic matter. Planktons or other microscopic organisms. The normal range of TDS is 500 to 2000 mg/lit (ppm). The range in case of analyzed sample ranges in between 2.1 to 6.1 mg/lit. The highest level of TDS was obtained in Khel-Deshpande the water source is from Hand Pump and the range recorded was 4005mg/lit. Followed by the 2480 mg/lit. From muddy type of water and the lowest level recorded was 402 mg/lit.

Total Hardness of water sample exceed to about 1000 ppm from the sample collected from Patherdi, Hand pump. Always it was observed that the water from hand pump contained higher amounts of salts and other metal ions. The lowest range obtained was 56ppm for the water sample collected from Khel-Deshpande whereas most of the other samples values range in between 240ppm to about 800ppm.

The Alkalinity of the water sample exceed to about 944 ppm, from the Patherdi, Hand pump. It was observed that water from Hand pump contains higher amount of Caustic soda. The lowest range was obtained 280 ppm, Bore well of Ranegaon. Whereas, most the water samples were found in between ranges 400 ppm to 600 ppm. In case of Iron, the water sample of Hand pump in Khel-Deshpande exceed to 2.380 ppm. The other water sample contains Iron ranges between 0.028 ppm to 2.08 ppm.

But, in case of Nitrate. It was notices that many of the water samples exceeds desirable limit up to 226.53 ppm, of Hand pump in Khel-Deshpande. From total 50 water samples 28 water samples below the desirable limit shows results. Fluoride could not be found in exceed limit in any of the water samples than its desirable limit. The lowest range was found to be 0.260 ppm, Tube well of Danapur and the highest range up to 1.34 ppm, Hand pump in Khel-Deshpande. Otherwise the water samples lie between the ranges 0.272 ppm to 1.291 ppm.

During the investigation the total 50 water samples, only 24 water samples were found to be potable for drinking purposes. it is necessary to treat water samples which are non-potable.

CONCLUSION :-

The present investigation entitled "Bacteriological and Physicochemical assessment of Potable Water Samples from Taluka Telhara, Dist. Akola" was carried out and following conclusions were drawn.

1) Water is vital for life. So for the consumption purpose water should be free of micro-organisms and other contaminants and metal contents.
2) Further steps should be taken to avoid the pollution of water with faecal contaminants and so proper treatments of water sources are necessary.
3) The water sample from various sources shows higher content of Irons, Fluorides and Nitrate. Similarly the T.D.S. and Hardness count was also more. So necessary action should be taken to remove the metal contents. Otherwise it may lead to health hazards.
4) Public awareness about pollution free environment is most important.

REFERENCE

APHA (American Public Health Association) (1998): Sediment pure water testing (proposed) Method 8080 – Limnol Oceanogr – 43, pp 1500 – 1510. | Ballester F., Sunyer J. (2000): Water and Health: Precaution must be guided for the health of the public. JEPIDEM C., 54(10): pp 729 – 729. | Bureau of Indian Standards (BIS) has specified drinking water quality standards as (IS 10500: 2004 and recently revised as 10500: 2012): pp 32-36. | Guideline Manual for Drinking Water Quality Monitoring and Assessment (2012): 2nd of the edition. | Nirain Rai, J. P. Sharma (1995): Bacterial contamination of ground water in rural areas of North West Uttar Pradesh. Indian Journal of Environment and Health, 37(1): 37 – 41. | Trivedi P. R., Raj. G. (1992): Books on Pollution – Centre of Ecology Sciences. Encyclopaedia of Environmental Science, Environmental Water and Soil Analysis, Vol. 15. | WHO (2004): Introducing Parameters for the Assessment of Drinking Water Quality. World Health Organization. |